ENGINEERING NEWS-RECORD

DEC. 22, 1960

4th Quarterly Cost Roundup

PRICE 50 CENTS

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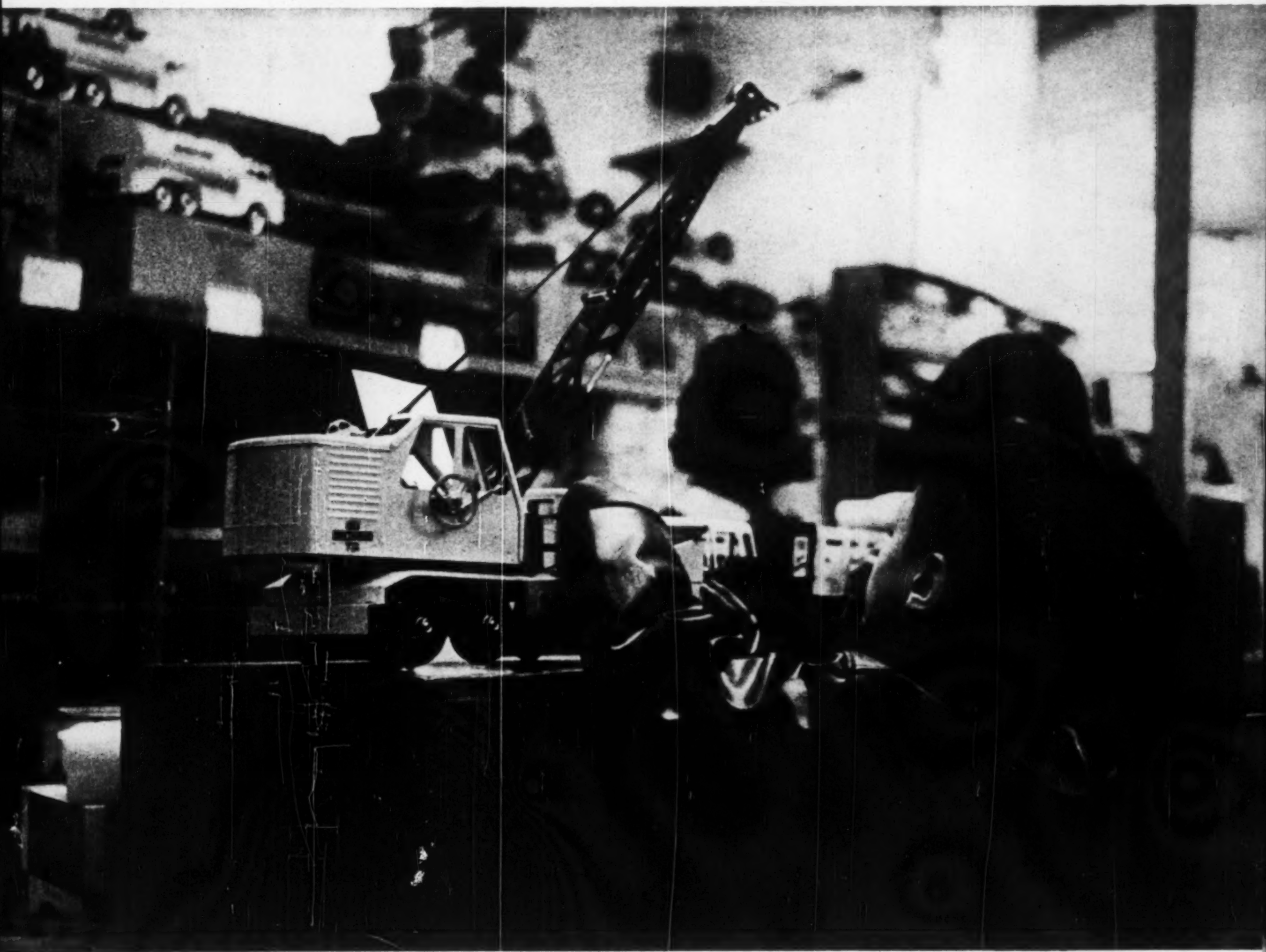
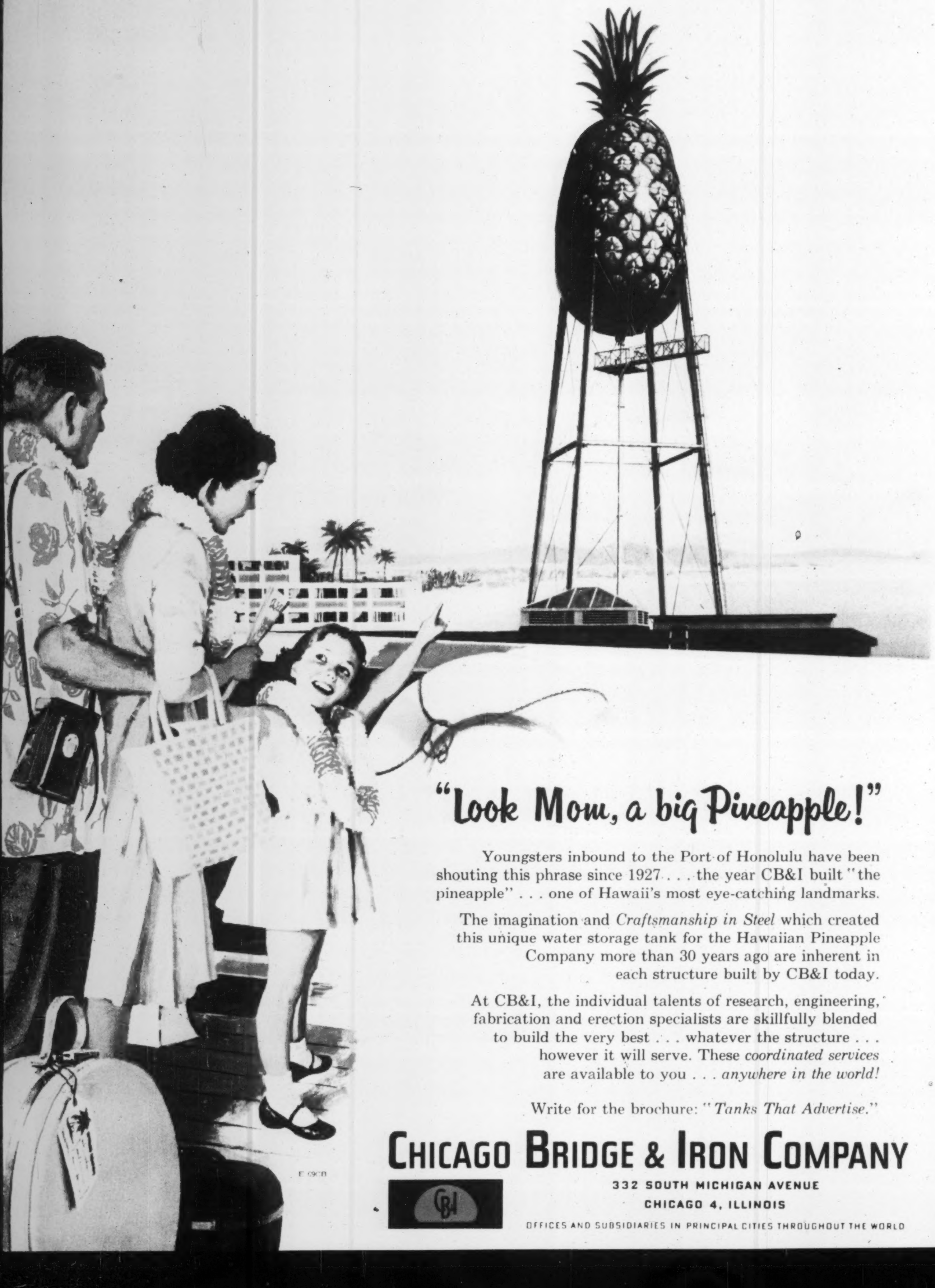


Shopping for materials or equipment? *p. 40*

A McGRAW-HILL PUBLICATION



"Look Mom, a big Pineapple!"

Youngsters inbound to the Port of Honolulu have been shouting this phrase since 1927 . . . the year CB&I built "the pineapple" . . . one of Hawaii's most eye-catching landmarks.

The imagination and *Craftsmanship in Steel* which created this unique water storage tank for the Hawaiian Pineapple Company more than 30 years ago are inherent in each structure built by CB&I today.

At CB&I, the individual talents of research, engineering, fabrication and erection specialists are skillfully blended to build the very best . . . whatever the structure . . . however it will serve. These *coordinated services* are available to you . . . *anywhere in the world!*

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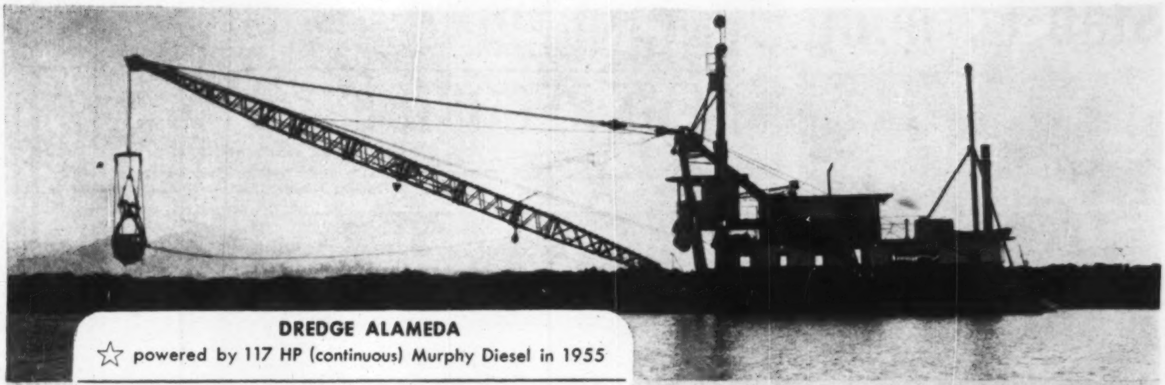
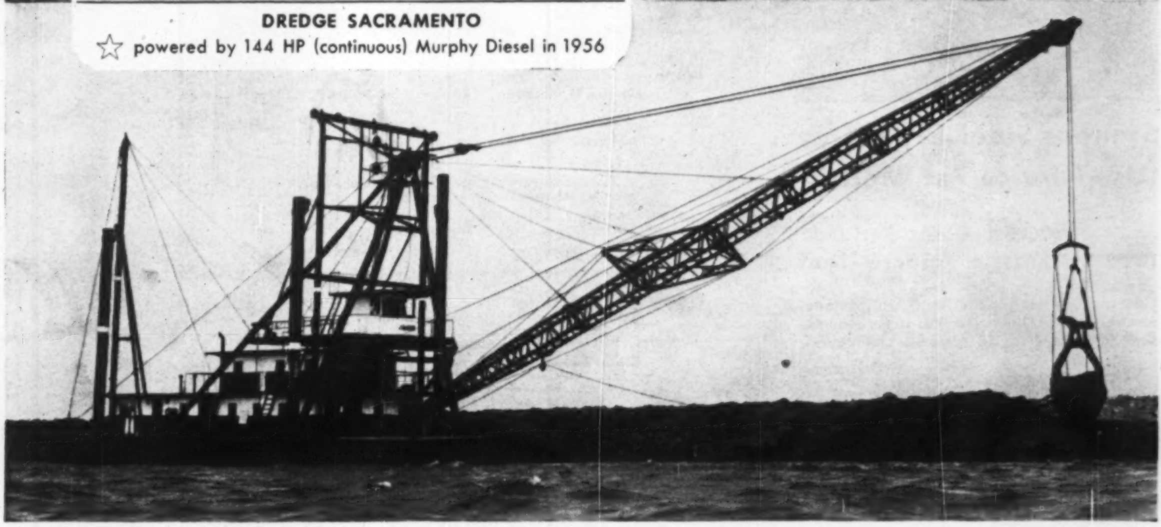


DREDGE ALAMEDA

☆ powered by 117 HP (continuous) Murphy Diesel in 1955



DREDGE SACRAMENTO

☆ powered by 144 HP (continuous) Murphy Diesel in 1956

☆☆"These two Murphy Diesels have run 24 hours a day, 6 days a week ever since installation, and there has been but one minor service interruption in a total of 47,808 hours. Their performance and steady operation is beyond anything I could say."

Edward A Dutra

Edward A. Dutra
DUTRA DREDGING CO. & DUTRA & SON, INC.
Rio Vista, California

In addition to years-full of dependable, trouble-free operation, Murphy Diesel's combination of exclusive features gives you "true" diesel performance . . . complete combustion that gets every ounce of power from every drop of fuel and high rising torque which makes that power *usable* where it counts . . . in the job! See your Murphy Diesel Dealer about the many other profit benefits Murphy brings to every construction job.

MURPHY DIESEL

429-N

PUTS MORE POWER INTO THE JOB

MP Series Murphy Diesel engines and power units are available in sizes from 105 to 320 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 60 to 188 KW.

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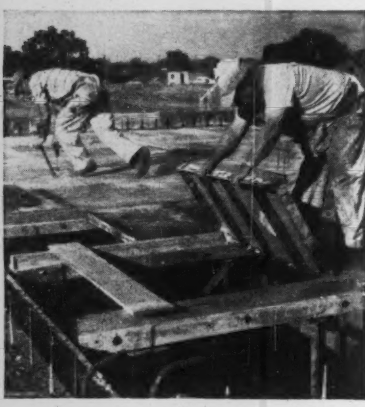
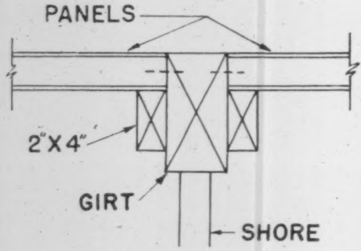
Slab Forming



Symons Steel-Ply Forms Used Twice Per Month

. . . Material Costs Reduced to 10 Cents a Square Foot

Slab forms were stripped in 10 days without disturbing the support shoring; still met specifications calling for 28 days of slab support.



2 x 4's bolted to girt are removed, for ease of stripping.

When constructing apartments on the campus of Stanford University, Howard J. White, Inc. had one big problem . . . how to reduce slab-forming costs. Symons Steel-Ply Forms were the answer.

4 x 6 girts, laid longitudinally with the floor slab, are first set in place on shores and flush with the bottom of the slab. When the slab is poured, it bears directly on the timber girt. Next, 2 x 4's are bolted to the girt to form a ledge. Symons 4 ft. Steel-Ply Panels are dropped in place on the 2 x 4 ledge. No connecting hardware is used . . . carpenters drive a nail through a form-hardware opening to the girt on each panel so that when the 2 x 4 ledges are removed, the panels will not fall.

For the complete story on *slab forming*, just send in your request. Symons Steel-Ply Forms are rented with purchase option.

Symons

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ENGINEERING NEWS-RECORD, Vol. 165, No. 25, December 22, 1960

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. **See panel below for directions regarding subscriptions or change in address. Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

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THE TOUGHEST SHOVELS BUILT... ...and the SMOOTHEST!

ANY shovel can dig *dirt!* But what is your output going to be in a job like this? Your Northwest is a *real* Rock Shovel. It's been proved over and over again. Begin with the foundation—Machinery Bases of alloy cast steel with cast steel machinery side frames—massive—capable of amply withstanding the wracking, twisting strains of rock digging—a base that frees you from periodic rebuilding.

Get on a Northwest! Get the feel of the controls. Feel that crowd take ahold. Find out what it means to watch that dipper bite up through in one smooth cut. Here is a combination—the Feather-Touch Clutch Control that brings ease of operation with the Northwest Dual Independent Crowd—a combination that brings a smoothness of maneuverability in handling the dipper the like of which you have never experienced before.

The Northwest Dual Independent Crowd utilizes force most independent crowd shovels waste. The Cushion Clutch eliminates shock overloads on operating machinery, Northwest design assures easier upkeep. These are just part of the many advantages that Northwest brings you for high output in rock work. They mean savings in time! They make money and assure your ability to take care of the unexpected. They combine to make the Northwest the finest machine of its kind.

Make your next machine a *real* Rock Shovel—a Northwest.

You can say... "THEY'RE ALWAYS READY TO GO!"

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8-90-14-LC

LUBE LOGIC Five ways to

Now's the time for battery check-ups

With cold weather ahead, your batteries will soon work harder than ever. Here's how you can help make sure they're up to it:

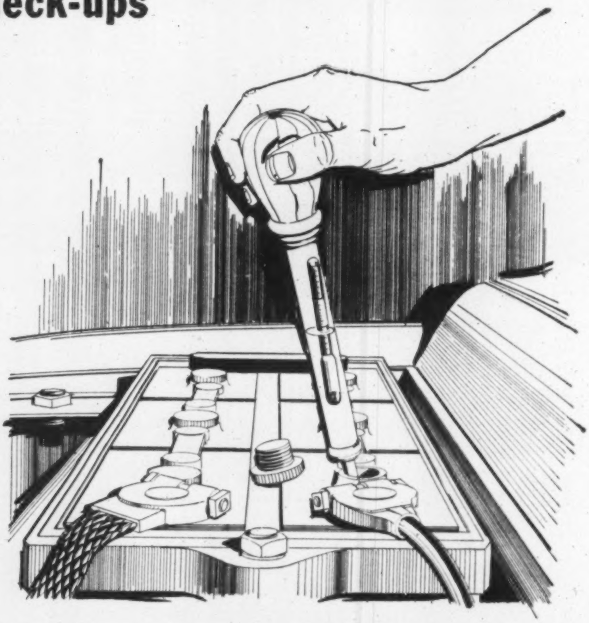
Inspection

- Inspect battery case for cracks and leaks. See that vents in cell caps are open.
- Check battery posts and cable clamps for looseness, breakage or corrosion.
- Using distilled water, bring electrolyte in each cell up to level indicated in cell opening.

Hydrometer test for specific gravity

- Use a temperature-corrected hydrometer to test the state of battery charge. Make sure battery has not been recently fast-charged, nor water added.
- Draw enough fluid from each cell to raise float off the bottom of the hydrometer tube. Holding hydrometer straight up-and-down, take eye-level reading of the neck of the float. Repeat for each cell.
- Note the temperature, and correct hydrometer reading by subtracting 0.004 from the reading for each 10°F. below 80°F. (Example: If hydrometer reads 1.280, and temperature is 70°F., corrected reading would be 1.280 – 0.004 or 1.276.

Normal state of charge for 12-volt battery is 1.260 to 1.280 specific gravity. For a 6-volt battery, 1.265 to 1.290 specific gravity.



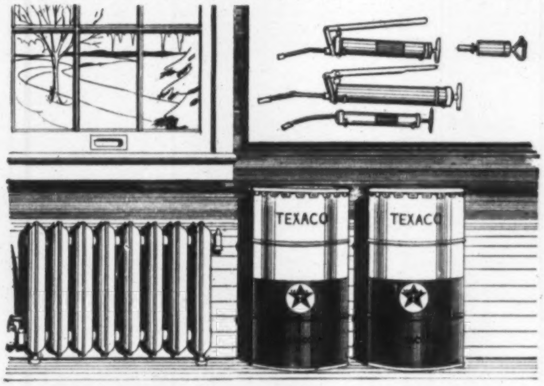
LEADING CONTRACTORS—EVERYWHERE—RELY ON TEXACO LUBRICATION

▲ **Isbell Construction Company** bulldozers remove reefs from river channel on Truckee River Flood Control project near Sparks, Nev. Isbell heartily endorses Texaco's Simplified Lubrication Plan.

▲ **Ledbetter-Johnson** gouges out largest rock cut (306 ft.) east of Rockies in highway project near Dalton, Ga. This company uses Texaco lubricants to keep their equipment on the job . . . their costs down.

◀ **Interstate Highway 80 Project** at Colfax, Iowa. Texaco Engineer E. A. Rolwes (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.

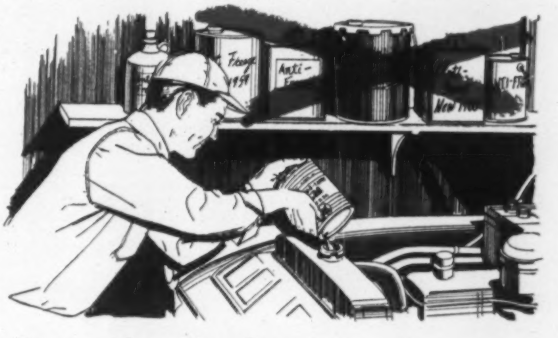
ease winter maintenance



Grease guns like it warm

Store grease guns this way, properly racked to avoid damage, and they'll give you much better service. Incidentally, lubricants like to be stored warm, too.

Warm up the guns if they're too cold to pump the lubricant. Best way is to bring them into a warm place far enough in advance of use. Don't ever attempt to warm them up by direct application of heat.



Save the engine — not the anti-freeze

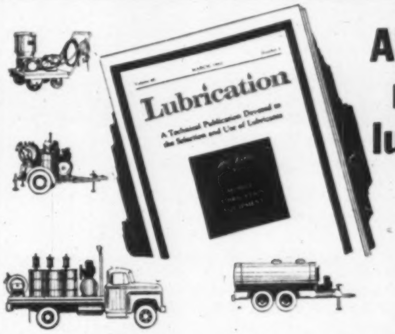
Go slow on using last year's anti-freeze. Although it might still give good protection against freezing, chances are those chemical additives that protect the cooling systems of your engines against rust and corrosion have lost their punch. Your best bet, after draining and thoroughly flushing the radiators, is to fill them up with fresh new anti-freeze — such as Texaco P-T Anti-Freeze.

"Easy does it"... after an oil change

When an engine's crankcase is drained — so is the oil pump's intake sump and pipe. And when the engine starts up, the oil pump must first suck up a lot of air before it starts chewing oil.

To avoid possible damage to the engine, idle it first at low speed. The oil pressure should begin picking up in a matter of seconds and reach normal readings within several minutes. Wait until it does — before you start working the engine.

All about mobile lube rigs


Lubrication
A Technical Publication Devoted to the Selection and Use of Lubricants

- How to make good lube rigs
- How to use lube records to make rigs more valuable
- Special purpose lube rigs
- Pros and cons of mobile and centralized lubrication

These are just a few of the facts about mobile lube rigs you'll find discussed in the March 1960 issue of Texaco's *Lubrication* magazine. We've devoted the whole issue to it —and we'll send you a copy *free*. Write today to Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. NR-21.

TEXACO LUBRICATION ENGINEERS

From time to time, we'll bring you "sleepers" like these—little angles that can mean big savings in time and money. But for any specific lubrication problem, call on your local Texaco man. He's your *best* source of money-saving lubrication ideas. Remember, "Lubrication is a major factor in cost control."

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Tune In: Texaco Huntley-Brinkley Report,
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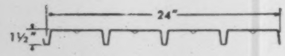
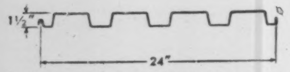
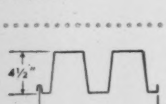


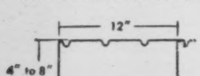
A-DECK — For purlin spacings not exceeding 8'4". Narrow ribs provide deck surface that supports the thinnest or softest type of insulation.



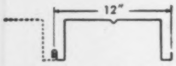
B-DECK — For spans to 10'0". Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel — well suited for use as side wall panels.



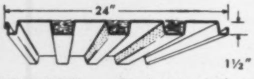
C-DECK—Carries normal roof loads over spans up to 24'0". Used extensively in canopies.



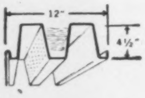
T-STEEL — New! Galvanized only — for clear spans to 32'0". Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to transmit seismic and wind loads.



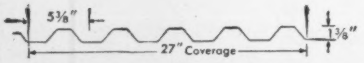
H-DECK — New! For simple spans from 10'0" to 20'0" — 3 and 4½" depths. Especially practical to cover walkways in shopping centers, schools, other installations.



B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10'0".



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24'0".



RIBFORM — High tensile galvanized steel form for concrete slabs over spans up to 8'0". Three types: Standard, Heavy-Duty, Super-Duty.

◆ Whether your design calls for a dry insulation board roof or for wet-fill, there's an Inland roof system for the job — by the makers of famous Milcor steel building products.

Inland steel deck weighs less than half as much as poured-in-place or pre-cast construction. You can space joists wider and use lighter framework, to save both time and money. Panels are easy to handle and weld in place — in any weather that a man can work.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually covers.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In.

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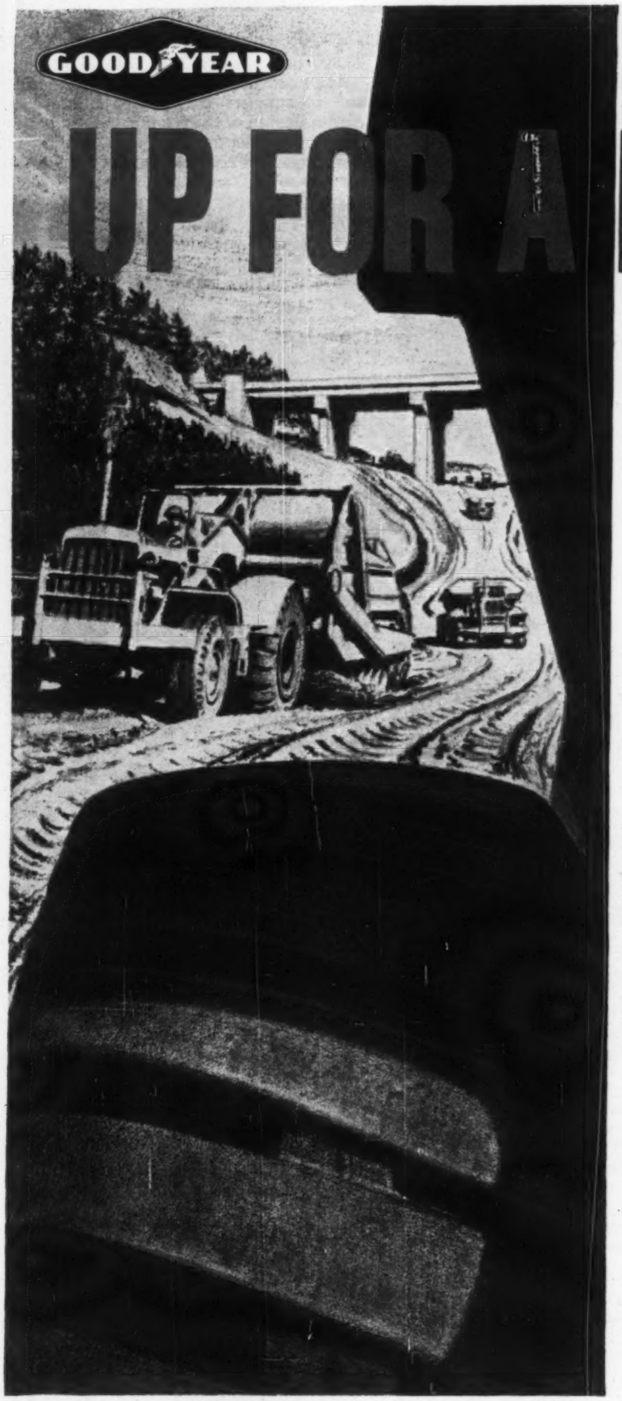

UP FOR A BIG BID?

Let Goodyear keep your tire costs down

FINDING THE WORK FACTORS—Goodyear Big-Tire Specialists are prepared to analyze your tire needs with an eye to keeping costs under control. These specialists will check the terrain, loads, climate, roads, schedules and speed problems that confront you, and can select the right Goodyear tires to help you solve them.

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SETTING UP BIG-TIRE SERVICE—You say the word, and Goodyear Big-Tire Specialists will set up a tire-maintenance program at the jobsite to help save you man-hours, machine-hours and useful tire life. In addition, Goodyear Contractor Service *will travel* with your job—handle all your tire maintenance and repair needs.

With BIG-TIRE PERFORMANCE
Example: SUPER HARD ROCK LUG

Here's one of Goodyear's Big Tires for the Big Bid you have coming up. It's the SUPER HARD ROCK LUG, built for heavy loads and no roads to make the going easy. Triple-tough 3-T Nylon Cord for the greatest tire stamina, plus new, special cut-shrugging rubber compounds, make this tire a real cost-saver in the roughest off-highway service.

For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

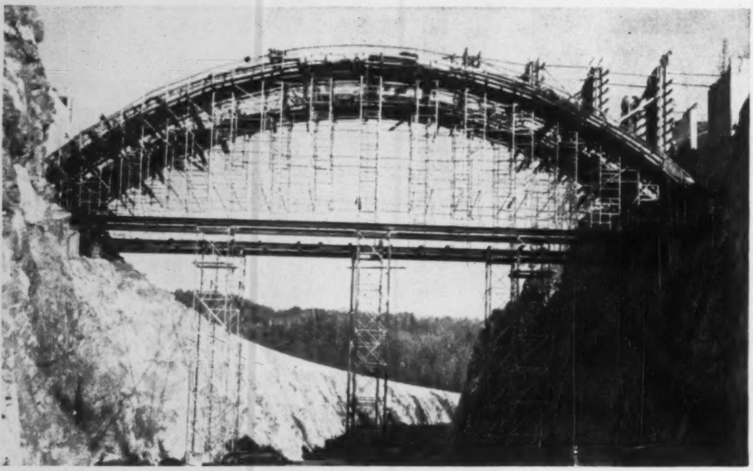
Lots of good things come from

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

CIRCLE 7 ON READER SERVICE CARD

New Heavy Duty 20K Frames Easily Shore . . .



. . . 8'-wide ribbon arches

For the 143'-long concrete bridge at Hogback Dam, Riverton, Conn., PS Co.'s new 4'-wide 20K heavy duty frames (designed to safely carry 10,000 lbs. on each leg) of "Trouble Saver"® Sectional Steel Shoring are quickly erected and spaced atop long I-beams to support 9,000 lbs. per leg imposed by columns and two ribbon arches 8'-wide by 1½' to 3'-thick, 34' center height. This shoring is supported by six 48'-high towers of PS Co.'s Extra Heavy Duty Shoring, which carries a total load of 32,000 lbs. per leg. White Oak Excavators, contractor.

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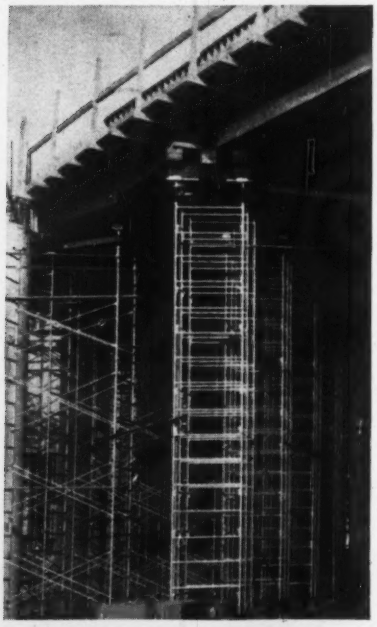
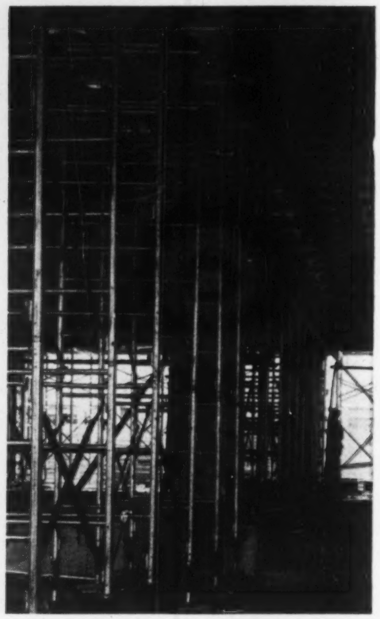
. . . 4'—5' Freeway girders

13,900 heavy duty 20K frames are now being used by Griffith Company, contractor, to support the heavy concrete box girder design of the six-mile Santa Monica viaduct connection, 15' to 33' high, to a Los Angeles Freeway. Bottom slab of box girders is 5½" x 6½" thick; top 5" to 5½" thick. Box depth is 4' to 5', made in three pours.





. . . 12¾" grid-type slabs

Here, 20K heavy duty frames are spaced 3'11" apart to support horizontal shoring for grid-type floor slabs. Floors in this 11-story Florida National Bank Building, Jacksonville, are 12¾"-thick. 20K frames are also used to shore heavy spandrel beams on the second floor only. George A. Fuller Co., contractor.

Concrete adhesives and mortars with **THIOKOL** polysulfide polymer

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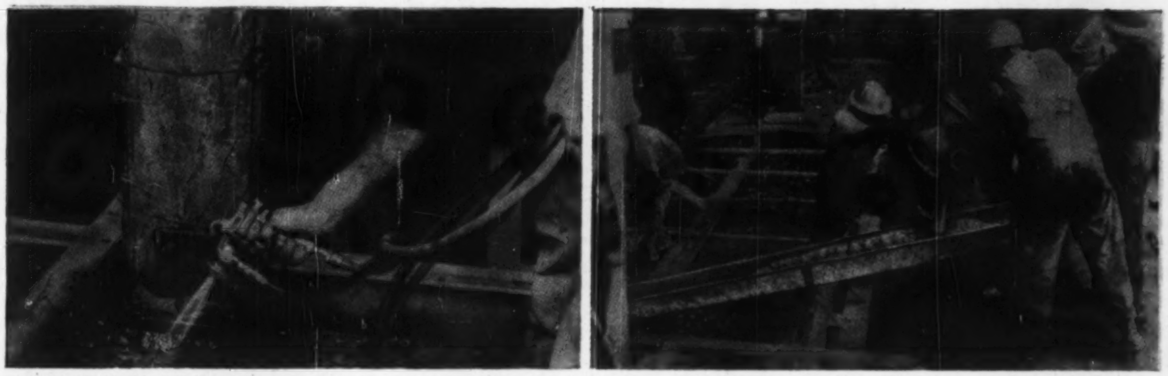
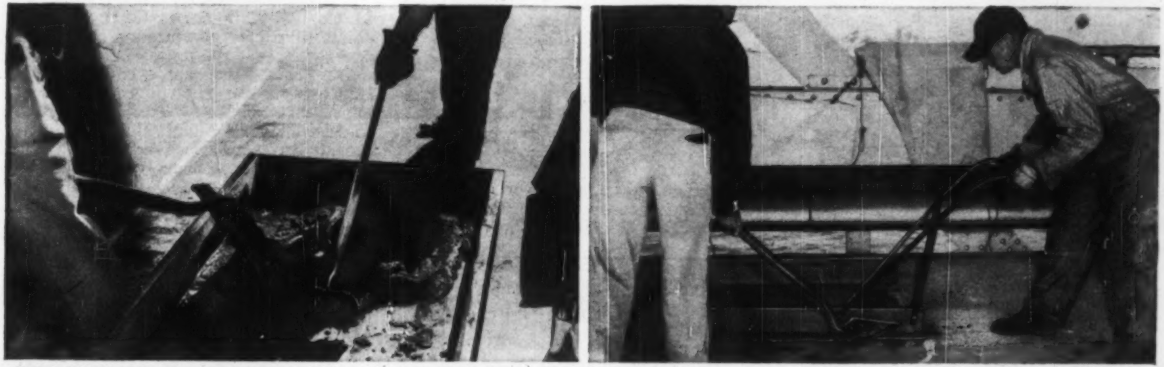


STRUCTURAL. Polysulfide-modified concrete adhesives join new concrete to old—or rejoin old sound concrete—with a *watertight* bond that's stronger than concrete itself. They have wide use in vertical building. Their application on this fire-damaged marine terminal (gutted concrete sprayed with adhesive then new concrete poured) avoided complete reconstruction, saved the city years of time and millions of dollars in remedial costs.



ROADWAYS. Polysulfide-modified mortars patch potholes and fill ruts and dips. In this application, adhesive and aggregate are mixed in a ratio of 1 to 5, spread and troweled like concrete. Digging down to bedrock or exposing steel reinforcements and pouring new concrete (conventional repair techniques which tie up traffic for days) is avoided. Polysulfide-modified mortar cures fast. Time, labor and the public temper saved.

FLOOR PATCHING. In plants where regular concrete has broken down under exposure to abusive traffic, chemicals or corrosive agents, mortars with THIOKOL polysulfide polymer have stood the test of time and wear.

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Thiokol Chemical Corporation is the raw material supplier of polysulfide polymer used in the manufacture of concrete adhesives and mortars.

FOR MORE INFORMATION: Mail Coupon to Dept. 2 CA-51
Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Send Thiokol's booklet "Concrete Adhesives for Concrete Construction & Maintenance." Also, a list of manufacturers marketing concrete adhesive systems.

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news and notes from the field

CRACKS IN CONCRETE: *why they occur—how to control them*

Cracking is one of the most misunderstood problems in concreting, and is generally regarded as a sign of defective concrete. On the contrary, most cracking is the result of improper construction practices and can be controlled by simple precautions.

Like other construction materials, concrete contracts and expands under various conditions of moisture and/or temperature. This normal movement should be anticipated and provision made for it in the design, placement and curing of concrete, otherwise cracks may result.

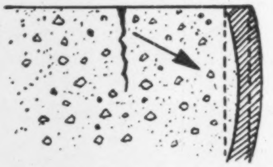
Generally, most cracking is caused by stresses exerted in or on new concrete while it is still "green"—before it has gained sufficient strength to resist such forces. A majority of cracks occur during the first few days after concrete is placed. As a rule, most cracks result from:

- **Shifting of concrete before it hardens**
- **Shrinkage and expansion of concrete before and after hardening.**

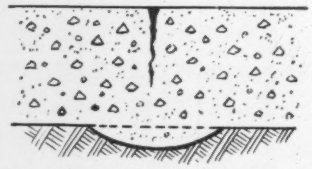
Shifting Before Hardening

This condition can cause cracks that are extremely difficult to diagnose. See Figures A, B and C. These cracks are caused by forces resulting from improper construction practices such as:

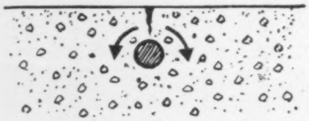
• Unstable forms • Unstable subgrade (uncompacted, frozen, muddy) • Subbase paper rupturing on uneven subgrade • Jarring of unstable ground • Improper placement of reinforcement (too close to surface).



A Bulging or shifting of forms due to timber expansion, loosening of nails or clamps, weak form construction, etc., can cause cracks having no particular pattern. Concrete surface distortion is usually the sign of form shifting.



B Subgrade paper rupture or poor subgrade allowing concrete to shift while setting can cause cracking as shown above.

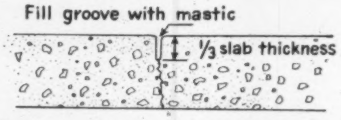


C When concrete settles over obstructions such as reinforcing steel, cracks may occur. This cracking can be prevented by using low-slump concrete and stable subgrade or good footings on good solid ground.

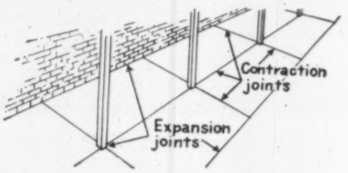
Shrinkage and Expansion

While concrete is plastic or fresh, it occupies its largest volume. When dry, cold and completely carbonated, it has its smallest volume. Varying conditions of moisture, temperature and age between these extremes cause concrete to shrink and expand slightly. Unless provision is made for these normal volume changes, and good concreting rules are observed, cracks may result. Shrinkage during hardening and drying can be greatly reduced by using as little mixing water as possible, dampening the subgrade and forms, and curing the concrete properly.

Shrinkage cracks can be prevented or effectively controlled by contraction and expansion joints, and use of low slump concrete.



D Contraction joints should be placed at points of stress concentration so that in case of shrinkage, cracking will occur neatly beneath the joint as shown in Fig. D. They can be neatly finished so final appearance of the structure is not marred. In sidewalks, place joints at 5′ or 6′ intervals. In driveways, place them at 15′ to 20′ intervals. In large floors, place joints at 15′ to 20′ intervals. In buildings divided into bays by columns, place joints where shown in Fig. E, but seldom over 20′ apart unless adequate steel is used. Cracks in solid concrete walls are minimized by using low slump concrete. Narrow feathering of concrete sections should be avoided to prevent cracking.



E Expansion joints should be placed at junctions of walks with driveways, buildings, curbs, light standards; where a floor joins a column base, stairway, etc., or anywhere else that concrete freedom of movement may be restricted.

Joints cannot be expected to prevent or fully control situations such as:

• Dry subgrade • Drying due to weather immediately after finishing • Carbonation in initial stages of curing • Lack of protection from low humidity atmosphere.

For more information on causes and control of cracking, ask your Alpha representative or write for the Craftsmanship in Concrete folder: "Cracks in Concrete".

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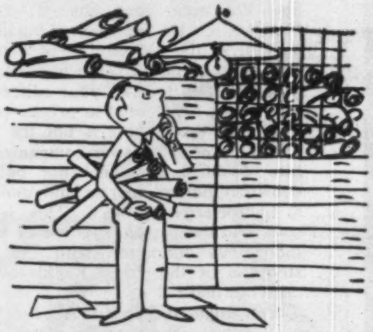

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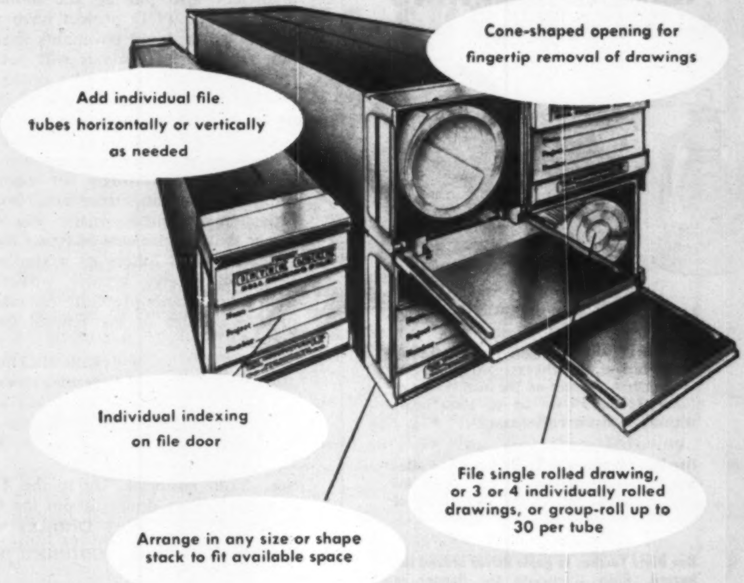
Cone-shaped opening for fingertip removal of drawings
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Individual indexing on file door
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Reader Comment

Up to the Task? Yes

Sir—We note your editorial (ENR Nov. 10, p. 116) questioning the ability as well as the advisability of a utility district to construct large hydroelectric projects. The tone of your editorial is that brains are limited to private power companies—or if this is not the case, then only private power companies can hire qualified personnel not only to construct but to operate and maintain a hydroelectric project. This is not true, and the personal failure of a few individuals connected with the construction of the Priest Rapids project does not make it so.

You might feel that it is a weakness of a public agency under which some individuals were evidently practicing some questionable acts and were thus subject to a grand jury investigation. We feel this is a strong point. Had it been a privately owned operation, such matters would probably have been swept under the carpet and ignored.

Another fallacy in your editorial is the inference that regulatory bodies control efficiencies in operation. This is not so because they are neither staffed nor authorized to govern the internal operations of a utility.

You evidently don't know that the financiers who put up the money to construct the PUD project have stipulations in the bond covenants that certain engineering analysis will occur at frequent intervals to make certain the project is being operated and maintained in a proper manner.

Finally, the utilities which have contracted for purchase of the power have the authority through an operating group to maintain surveillance over the project in the future years. We would wager that the projects of Priest Rapids, Wanapum and others of a similar nature will receive greater surveillance than many plants presently operated by private utilities or the federal government.

Ken Billington
Executive Secretary
Washington Public Utility
Districts Assn.
Seattle, Wash.

Sir—Your editorial "Up to the Task?" expresses grave doubts about the Grant County Public Utility District's ability

(*Reader Comment continued p. 20*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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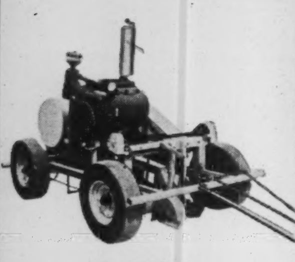

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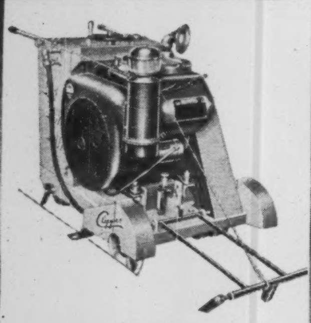

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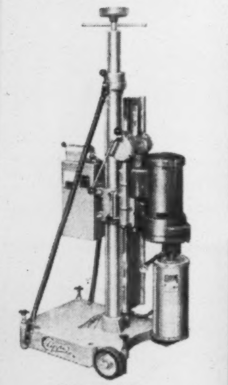

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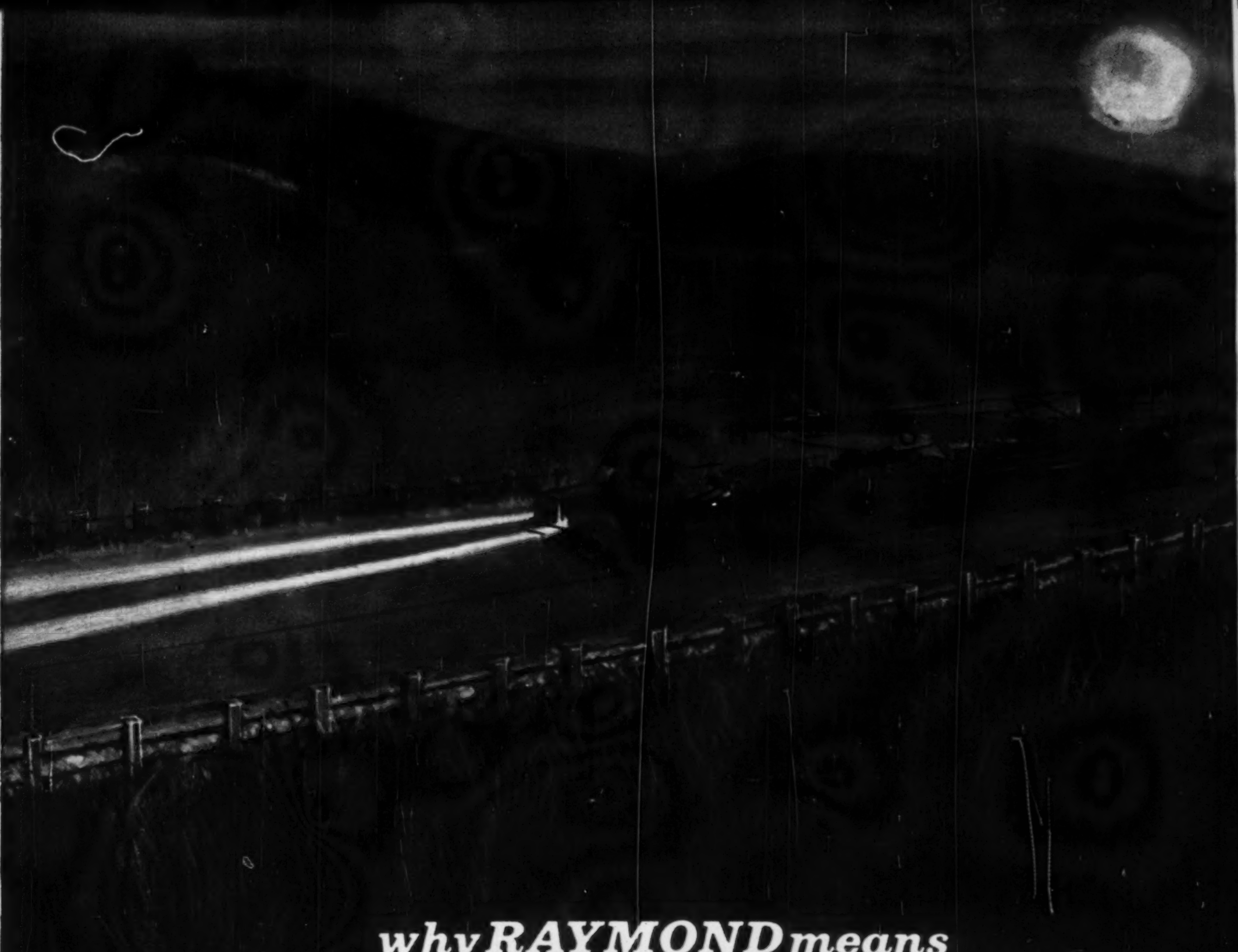

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. . . on land

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. . . in the air

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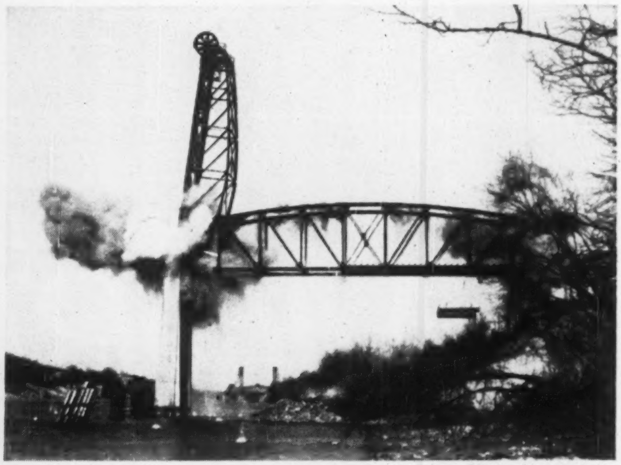

Photo: Max Araujo

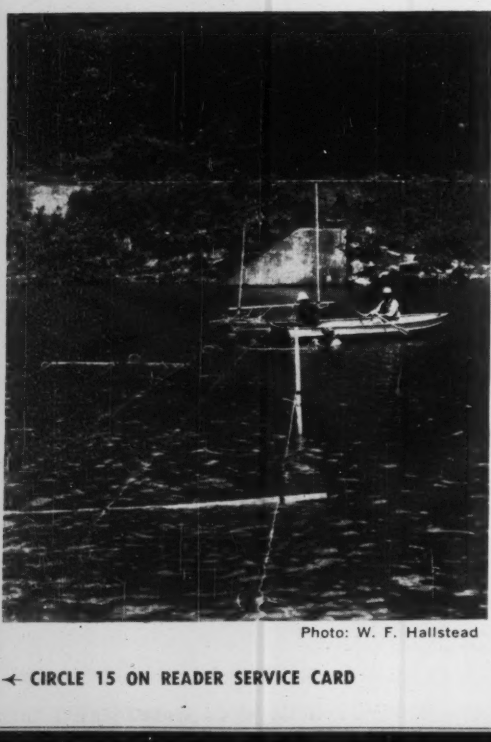

Photo: W. F. Hallstead

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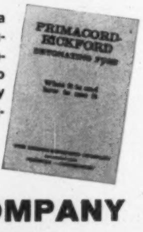

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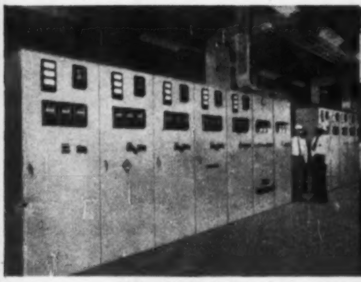
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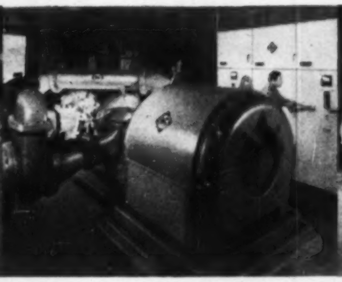
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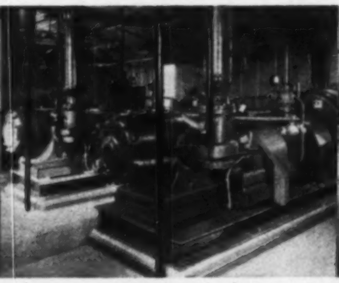
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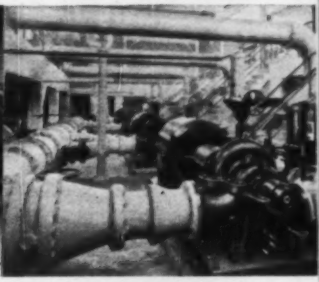
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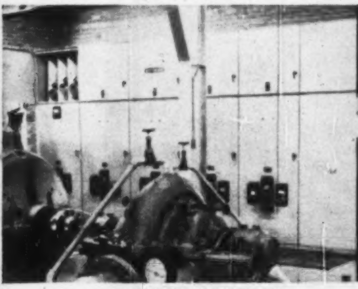
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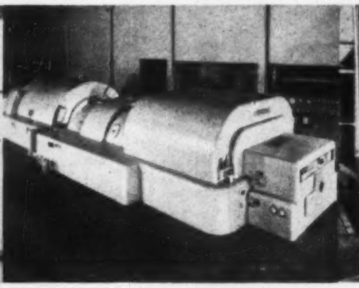
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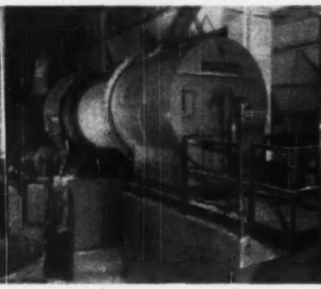
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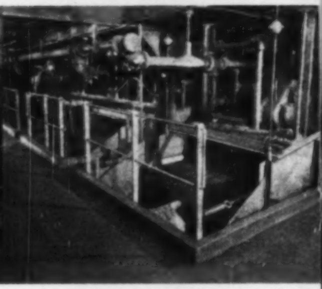
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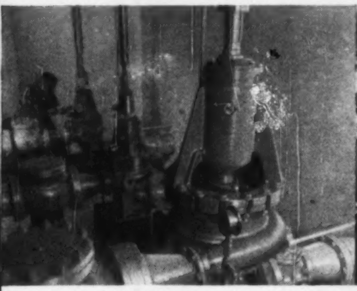
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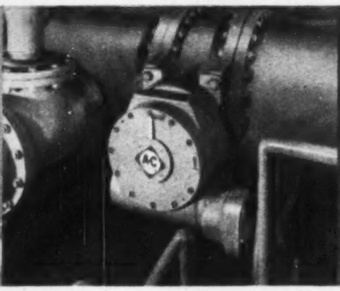
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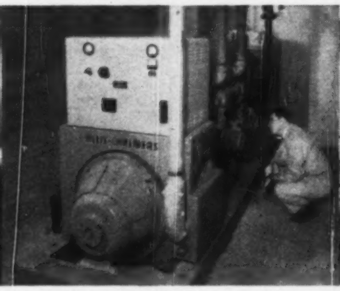
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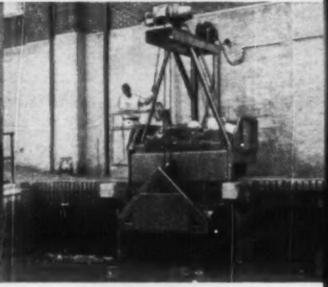
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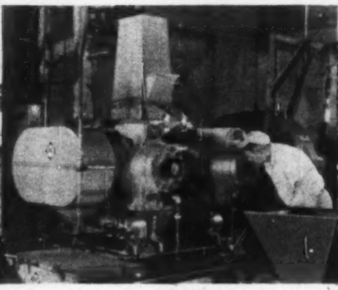
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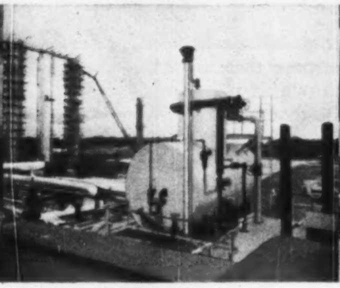
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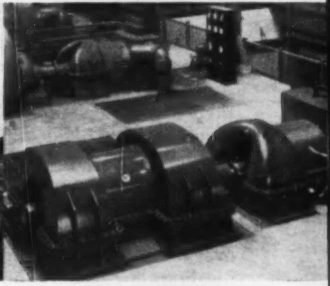
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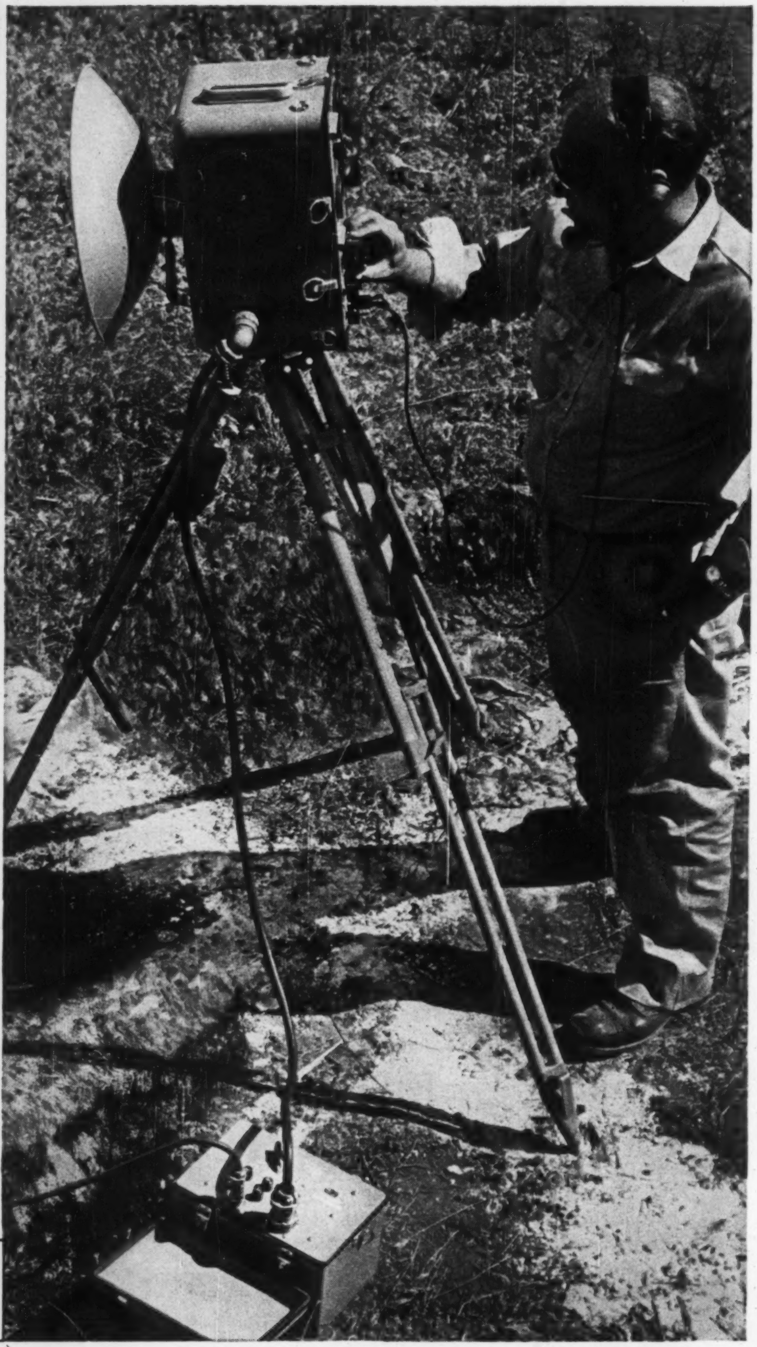
Municipalities all over the world have modernized, expanded and prospered with expert engineering and application help from Allis-Chalmers. *For complete details, call your nearby A-C office, or write* **Allis-Chalmers,** *Milwaukee 1, Wis.*

***Additional Public Service Products** — Transformers, condensers, circuit breakers, voltage regulators, substations, generators, vacuum pumps, sifters, engines, lift trucks, graders, and other earth moving equipment. A-1311

CIRCLE 17 ON READER SERVICE CARD

MEASURES 50 MILES IN FIVE MINUTES!



Cubic Electrotape electronic surveying equipment measures distances from 250 feet to 100 miles in almost the twinkling of an eye. Electrotape accuracy, even under environmental extremes is 1 inch +1 part in 400,000.

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Here are two recent examples of Electrotape efficiency. A crew establishing microwave stations along a 1400-mile pipeline for Pacific Gas & Electric used Electrotape to complete the job in two weeks. San Diego County, California, which is larger than the State of Connecticut, is saving years by using Electrotape in an extensive county-wide surveying and aerial mapping program.

Two identical tripod-mounted Electrotape units are used to measure a given distance. As each unit can be operated by one man, surveying crew expenses are minimized. A radio transmitter and receiver, operating on radar frequencies, and ultra-precise phase-measuring equipment, form the heart of the system.

HOW IT WORKS

In simplest terms, Electrotape measures the time it takes for a radio wave to travel from one unit to the other and back again. Since the speed that radio waves travel is known, it is then easy to calculate the distance involved. An Electrotape operator requires no knowledge of electronics, and can learn the basic techniques in only 20 minutes. The equipment is lightweight and may be back-packed over rough terrain. A built-in communications link enables the Electrotape operators to converse, for maximum field efficiency.

Savings made possible by Electrotape can easily pay for equipment cost in less than 1 year. Write today for your free copy of a booklet on Electrotape, to Dept. ENR-2, Industrial Division, Cubic Corp., San Diego 11, California.

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ALLIS-CHALMERS

One of three 96-inch **Howell-Bunger** valves in operation at the U. S. Engineers Mud Mountain Dam, White River, Wash.

2 ways to air-cushion a big splash

...and provide easy regulation of free discharge

***Howell-Bunger* valves** produce an expanding, aerated water jet that dissipates tremendous energy with minimum erosion and cavitation — and virtually no vibration. They're ideal for free discharge with high to low heads, into atmosphere or water. Lowest in initial cost . . . economical to install (need pipe line or conduit of *minimum* size). Only one moving part in contact with flow.

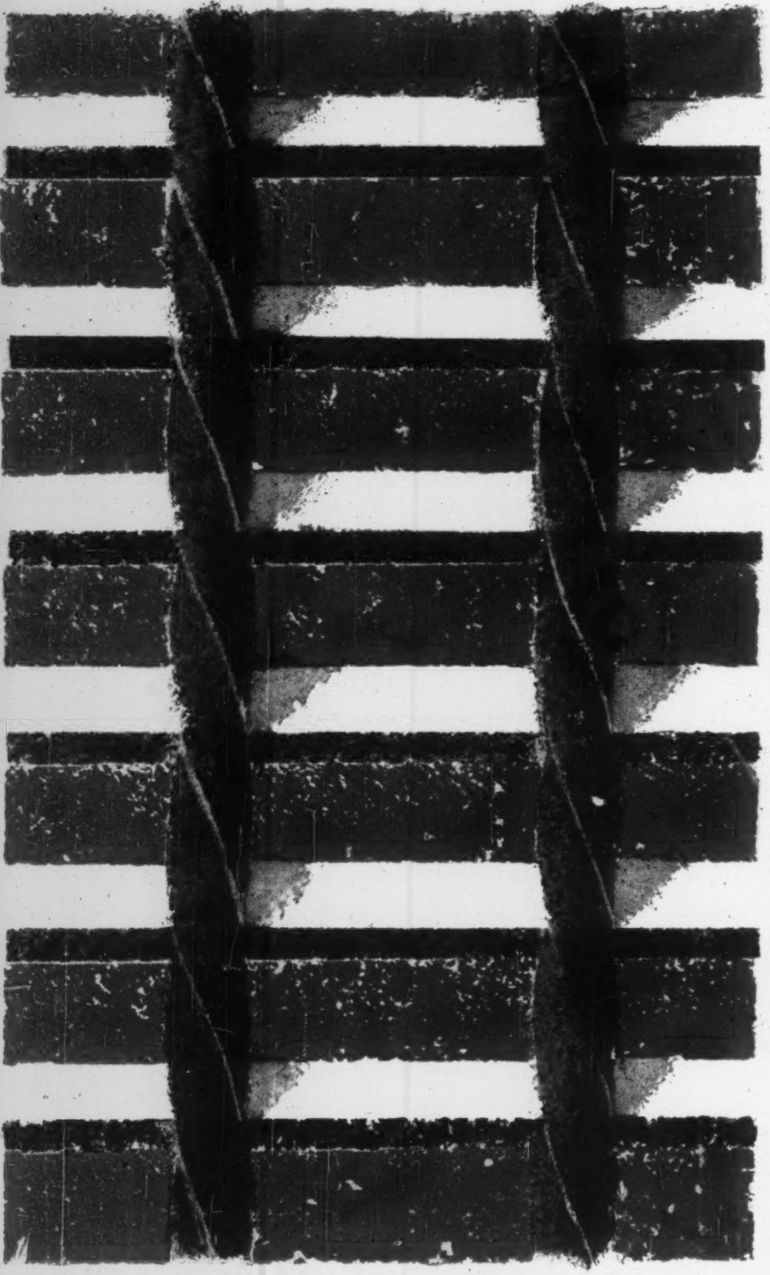
***Ring-Jet* valves** yield a concentrated, aerated jet, perfect for locations requiring reduced spray. A logical development from the *Howell-Bunger* valve, they offer many parallel advantages . . . are equally suited to high and low heads.

Only Allis-Chalmers is geared to equip complete hydro installations — turbines, generators and auxiliaries. Contact our office in your area for information. Or write ***Allis-Chalmers,*** *Hydraulic Division, York, Pennsylvania.*

A-1256

One of two RING JET valves used for irrigation bypass from Tulloch Dam, California.

CIRCLE 19 ON READER SERVICE CARD



Blaw-Knox Electroforged Grating solves so many problems for so many industries. Catalog free on request. Write Blaw-Knox Equipment Division, Pittsburgh 38, Pennsylvania.

BLAW-KNOX
GRATING

CIRCLE 20 ON READER SERVICE CARD

to successfully construct and operate the Priest Rapids Development. Your considerations were limited to the surface, not the substance, of the problems and, therefore, I believe your conclusions are not valid. May I explain further?

The first thing to appreciate about the Grant County Public Utility District is that they have done a remarkable job during these last five years in creating low-cost electric power for the Pacific Northwest. Remember that the Corps of Engineers was originally authorized by the Congress to design and construct Priest Rapids, using a single high dam scheme, and the estimated federal investment would have exceeded $400 million. Due to the Corps of Engineers inability to schedule an early start for fiscal reasons, the Public Utility District saw that power availability would be delayed for years unless they themselves stepped into the picture.

Public Utility District studies showed that the project could be divided into two lower dams to be called "Priest Rapids Development" and "Wanapum Development" which would give a net saving in investment of about $50 million, plus a number of other advantages.

Encouraged by these findings, both public and private power agencies in the area were so enthusiastic about the new Priest Rapids Development that they united in an agreement to take and pay for all of the power that the Priest Rapids Development could generate.

A $166-million revenue bond issue followed, construction started at a rapid pace, and the development will be finished within a period of a few months.

A similar sequence of events has happened at the Wanapum Development. As a direct result of the Public Utility District's activities at Priest Rapids, the power will be available to Pacific Northwest customers years ahead of the Corps of Engineers' schedule; the entire project will cost $50 million less, and the project will be paid for by the power users rather than by government funds.

Don't you agree that the Public Utility District has done an outstanding job?

The question you raise of new legislation and regulations for rapidly growing local publicly owned utilities seems very difficult to support. These Public Utility Districts are now, and always have been, subject to the same scrutiny, disclosure requirements, etc. as privately owned utilities in the area and other public bodies. By their nature, Public Utility Districts must conduct all their business in public and this is not true of either federal or private power agencies. It is not at all obvious that additional governmental regulation of Public Utility Districts would pro-

(*Reader Comment continued p. 26*)

. . . the important element
in connecting branch mains . . .
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MUELLER CL-12 Drilling Machine

■ By using Mueller "quality-matched" equipment and machines, you eliminate the need for extra adapters and fittings, thereby reducing set-up time. The automatic power operation of the CL-12 Machine frees the operator for other work around the job-site, and reduces cutting time.

■ The total reduction of on-the-job time is one of the big reasons to standardize with Mueller equipment and machines. Ask the Mueller Representative in your area for complete details on this and many other safe, fast operations using quality Mueller products.

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Basic Benefit from...

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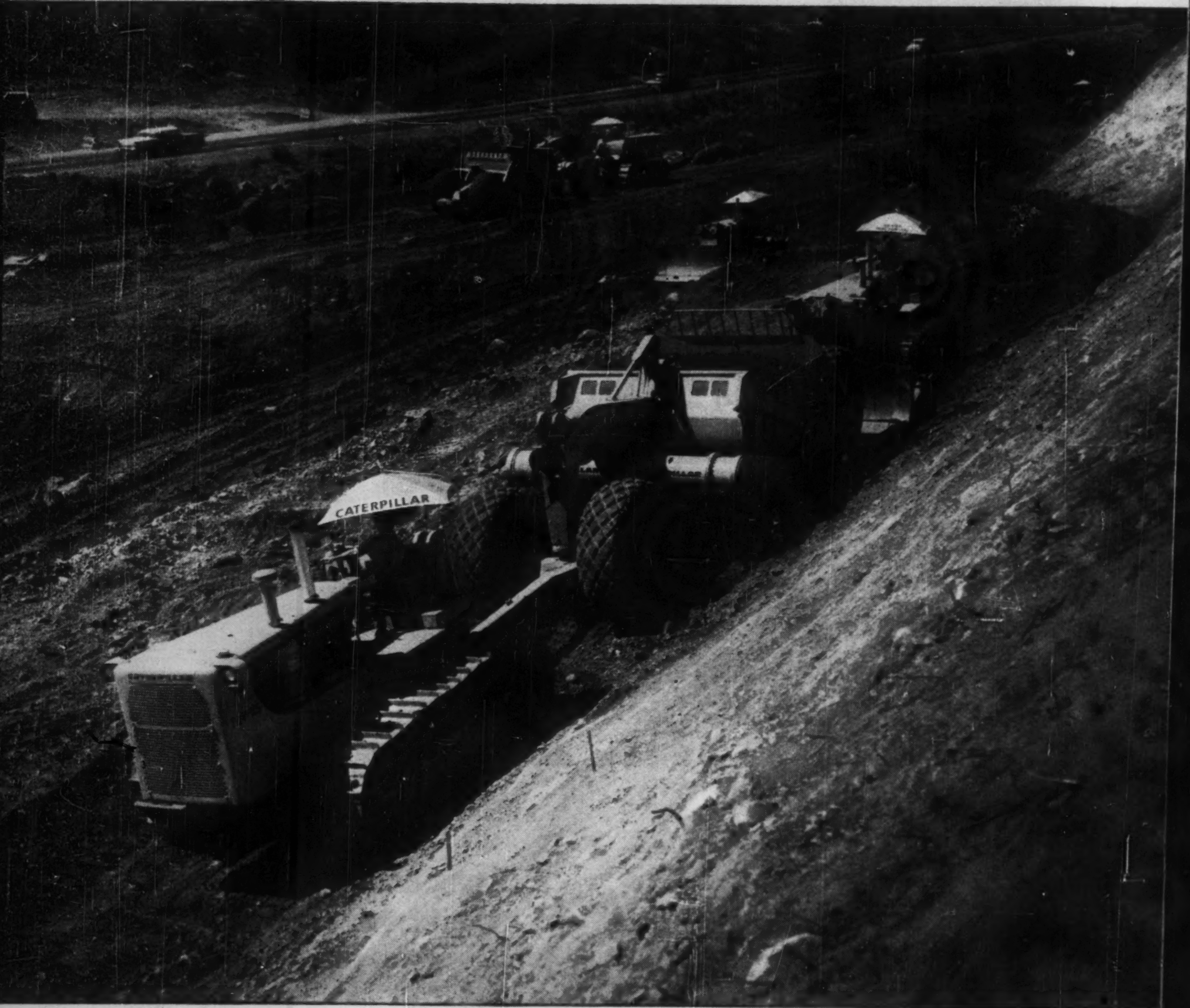
MILE-HIGH CALIFORNIA ROAD JOB

NEW TRACTOR-REALLY



Packs it in—two D8H Tractors, pulling and pushing, fill a 491 Scraper with hard-to-load breccia, a cemented gravel, in 45 seconds.

SCRAPER TEAMS PRODUCE

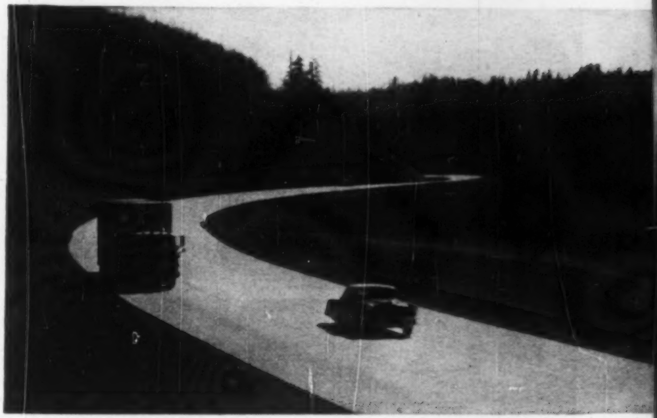
"A GOOD COMBINATION FOR THE ROUGHEST WORK"

TAKE boulders, volcanic ash and mud—mix well with decomposed shale—then add mile-high working altitudes, side-hill operation and unfavorable weather . . . these are some of the problems facing A. Tiechert and Son Inc. as they push a new highway through the Sierra Nevada Mountains in Eastern California. The job, 7.8 miles of freeway construction on State Highway 40, involves moving two million yards of earth in two five-month seasons. In spite of the obstacles, the Sacramento contractor holds the work to schedule, expects to complete the job on time this October.

Four D8 Series H Tractor-491 Scraper teams, push-loaded by D8s of the same series, set the pace for this difficult job. Because of the steep hill haul roads, they start the cuts and fills, then handle earthmoving on hauls up to 700 feet. DW21 wheel units take over on the longer hauls that range up to 7000 feet.

"The 491 Scrapers with D8s front and rear performed very well—especially in wet, rocky ground," says W. W. Staring, Project Manager. And he adds, "Operators and foremen especially like the 491 in rock because of higher apron clearance, excellent ground clearance and the good distance from axle to apron. In most cases we used D8-491 teams instead of shovels on shot breccia. It's a good combination for the roughest work."

On rugged big volume, short haul operations like this, Caterpillar track-type Tractor-Scraper combinations are the most efficient way to move earth. The new D8 Series H, for example, is over two tons heftier than the previous model, packs 23% more horsepower (235 flywheel HP), and with direct drive has a speed of 6.3 MPH forward. Team it with the 491 Scraper (34 cu. yd. heaped, 27 cu. yd. struck) or the 463 Scraper (28 cu. yd. heaped, 22 cu. yd. struck) for big capacity loads.



The finished product—traffic moves with speed and safety over a newly completed section of California State Highway 40.

Get all the facts—plus a profit-proving demonstration—on the new Caterpillar D8H Tractor and the 491 Scraper from your Caterpillar Dealer. He's ready right now!

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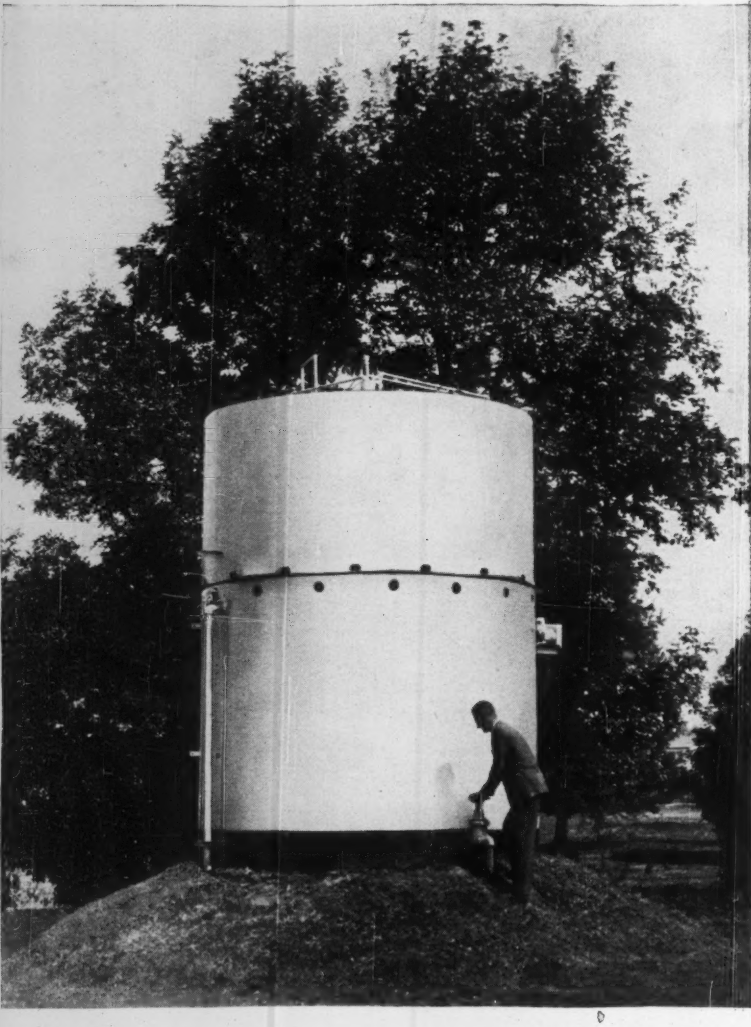
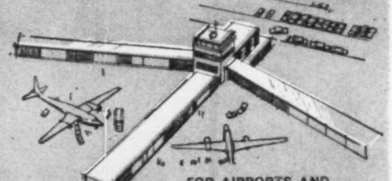
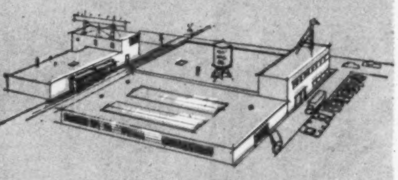


FOR SUBURBAN DEVELOPMENTS



FOR AIRPORTS AND MILITARY INSTALLATIONS



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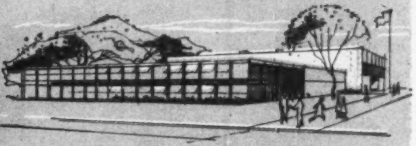

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Bio-Pac is available in capacities to serve 50 to 500 people, and is designed to operate efficiently in areas remote from metropolitan sewage service. It is a scaled-down version of two-stage, large-capacity bio-filtration plants that serve major cities, and it meets the Ten States Standards for sewage works.

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Link-Belt will work with your consulting engineer or architect to find out how Bio-Pac can best serve you. Write LINK-BELT COMPANY, Dept. AV, Prudential Plaza, Chicago 1, Ill. Ask for Folder 2971.

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Listed below are just eight of the many contractors who are American Mutual policyholders. What's remarkable about them? Well, they have all been with AM over 20 years. They have all saved substantial sums on their insurance costs over the years. They have all received sizable dividends from AM *every year*. In short, they have all found out what AM means by *better protection . . . lower cost.*

Company	**No. of years insured with American Mutual**
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Warren Brothers Roads Co., Cambridge, Mass.	25 years
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Thompson Construction Corp., Albany, N.Y., Camden, N.J.	21 years
Kansas City Structural Steel Co., Kansas City, Kansas	25 years
T. A. Loving & Co., Goldsboro, N. C.	23 years
Atkinson Dredging Co., Inc., Norfolk, Va.	22 years

Why not find out what better protection . . . lower cost could mean to you. Talk to the AM man yourself. Or ask us for names of policyholders near you who know American Mutual first hand (we'll be glad to send their names). Write American Mutual, Dept. EN-7, Wakefield, Massachusetts.

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How PAYLOADER® Versatility

Pays-Off on 5 Different Jobs

These typical reports from five contractors tell what the H-90 "PAYLOADER" means in on-the-job earning power...

4-Mile Sewer in Texas— Sup't says, "This machine is indispensable. It works over pavement, gutters and walks with full loads, handles sand and materials at the *lowest possible cost.* I'd hate to tackle this work without the big 'PAYLOADER'."

Tearing Up 70 Blocks of Streets in Minnesota — Operator says, "This rubber tired rig is handy for stripping old blacktop right off the road . . . we work a block here and a block there, and I can *move to them as fast as any truck.* The bucket control is exact for windrowing in second gear. With a ________ machine, you couldn't do this kind of work."

Clearing Right of Way in New York — Vice Pres. says, "This single rig accomplishes everything needed in our work . . . in stump load-out alone, the H-90 (with 4-in-1 bucket) has cut our load-out costs about ½ over the previous method used."

Sand and Gravel Operation in Michigan — Operator says, "I've been driving cranes, dozers and loaders since 1936 but this is *the best front end loader I've used.* It's a wonderful machine, it operates so much easier than the ________ we have here."

Key Machine — There's no limit to the cost-cutting usefulness of a dependable "PAYLOADER" in new construction, repair and maintenance work. The mobility and work-versatility of these units save *time,* and the *high cost* of single purpose machines . . . pay off by protecting your profits on any job.

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vide any more protection to the public.

The implication of the editorial that only private utilities or large federal public agencies have the ability to successfully construct, manage, and operate large power systems is of grave import.

Are we to assume, therefore, that you support the thesis that all publicly owned large power generation facilities should be in the hands of the federal government? This is a very surprising position. Had this approach been followed, the Priest Rapids, Wanapum, Rocky Reach, and Box Canyon plants in the West and the Barnhart Island and Niagara plants in the East would at this time either not have been built at all, or be federally owned. In the latter case, because of the "preference clause" in federal projects, no privately owned utility could have had an assured supply of power from these plants. This would have indeed been a far cry from the present case, where privately owned utilities have firm contracts for the bulk of this power.

In these days, our national security and well being are heavily dependent upon a rapidly growing basic economy. This must necessarily rest on a foundation of continuing resources development.

The cooperating efforts of all the different power producing agencies are needed now to support economic growth in the Pacific Northwest. Therefore, nothing is to be gained by taking projects out of the hands of organizations which, like the Grant County, Pend Oreille County, and Chelan County public utility districts, have proved themselves to be able and creative power producers. By the same token, we would all suffer by the legislative or regulatory hobbling of such capable organizations.

After studying the Priest Rapids story from the beginning, I am convinced that the Grant County PUD is easily "Up to the Task"!

RICHARD D. HARZA
Vice President
Harza Engineering Co.
(Consulting Engineers, Priest Rapids Development)

Editor's note: We did not mean to imply that only private utilities or federal agencies have the brains to build projects such as Priest Rapids and Wanapum dams. We merely suggested that there are inherent dangers in such small local bodies as Grant County Public Utility District tackling jobs as big as this one.

When these two projects are built and operating, they will stand as tribute to their owners, engineers and constructors—as pointed out in our editorial. If their construction had been administered flawlessly by the PUD, it would be most remarkable. As it is, question remains as to how situations encountered—including bribery charges—might have been avoided.

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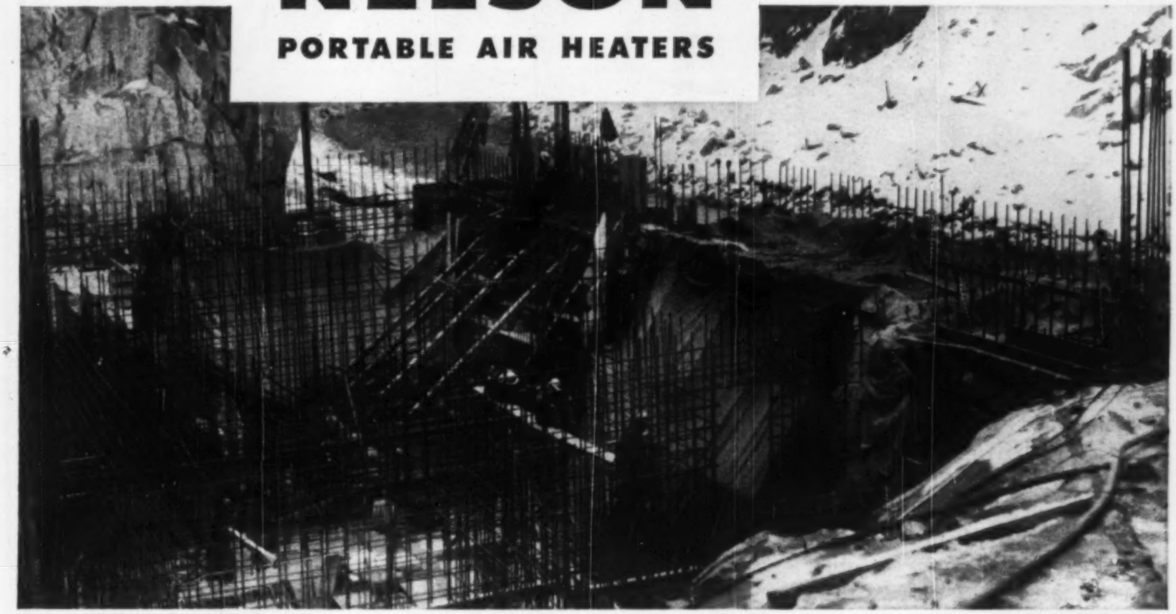
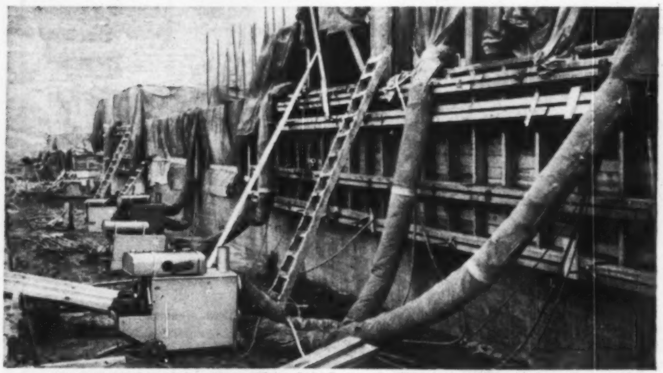
everybody else does!



$14 MILLION FREMONT CANYON POWER PROJECT, now nearing completion in Wyoming, has used Herman Nelson "Thrifty" heaters through two severe winters to avoid job shut-downs. "Thrifty" heaters proved their ability to "take it"—gave continuous service under tough field treatment, rough terrain and weather. Contractors: Coker, Kiewit, Cunningham.

PAN AMERICAN

PAN AMERICAN relies on Herman Nelson portable heaters for cold weather operations at Idlewild Airport. Safe Herman Nelson units meet the strict specifications of Pan American and Port of New York Authority.



IN SUB-TROPIC MIAMI—a big job for portable heat! The job—thoroughly drying out 35 concrete silos at Lehigh Portland Cement Co.'s modern Miami plant. Clean, uncontaminated heat was supplied by a battery of "Utility" heaters. Contractors: Walsh, Perini, Rooney Companies.

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The new USS "T-1" Type A Steel is the first addition to this family of constructional alloy steels. It is a quenched and tempered constructional alloy steel produced in thicknesses through 1″ maximum with the same tremendous strength, weldability and resistance to impact abrasion as "T-1" Steel. However, through the development of a new analysis, "T-1" Type A Steel is a *more economical* steel for many applications. USS "T-1" Type A Steel was developed through U. S. Steel's continuous research efforts to produce new and better products at the lowest possible cost. It is available in bars and semi-finished form and in plates from 3/16″ through 1″ thick inclusive, and in the full range of plate widths and lengths now available in USS "T-1" Steel. If extra hardness is needed, USS "T-1" Type A Steel can be furnished to a minimum Brinell hardness of 321.

For your copy of a properties card on USS "T-1" Type A Steel, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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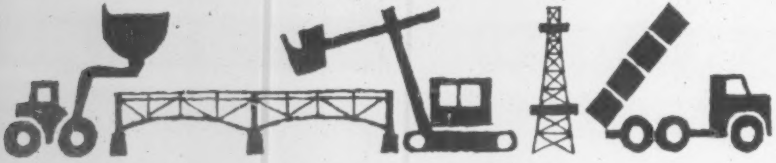

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2. Sold to the following chemistry: †

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Mn	.70/1.00	Mo	.15/.25
P	.040 Max.*	V	.03/.08
S	.050 Max.*	B	.0005/.005
Si	.20/.35	Ti	.01/.03

3. Quenched and Tempered to meet the following mechanical properties:

	3/16″ to ¾″ incl.	Over ¾″ to 1″ incl.
Min. Yield Strength	100,000 psi	100,000 psi
Tensile Strength	115,000/135,000	115,000/135,000 psi
Elongation in 2″	18% min.	16% min.
Reduction of Area	40% min.	50% min.

4. Charpy impact values**
15-foot-pounds at minus 50°F. based on longitudinal keyhole test.
5. This steel can also be produced to a min. BHN of 321, and when so produced, all other mechanical properties are waived.
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*When ordered to FBQ (Fire Box Quality) max. P is .035 and max. S is .040.

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BULLETIN 291

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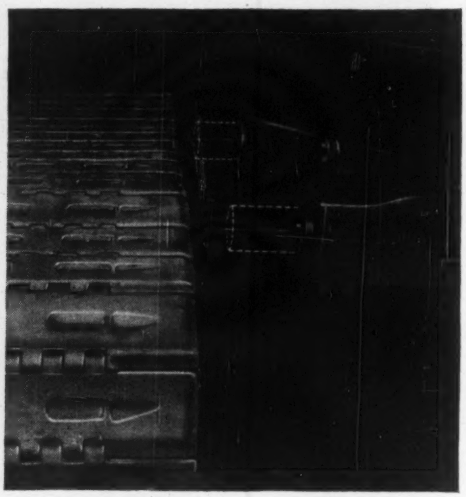
CIRCLE 27 ON READER SERVICE CARD

New 80-ton crane features faster, simpler removal of side frames for easier shipping

LORAIN
LORAIN



The new Lorain 880 Crane has long, wide, heavy crawlers with an all-new way to remove side frames. Unique telescopic axles actually *slide out* of the frames . . . instead of frames being dragged off axles. The *complete* frames are then quickly lifted to car or truck.

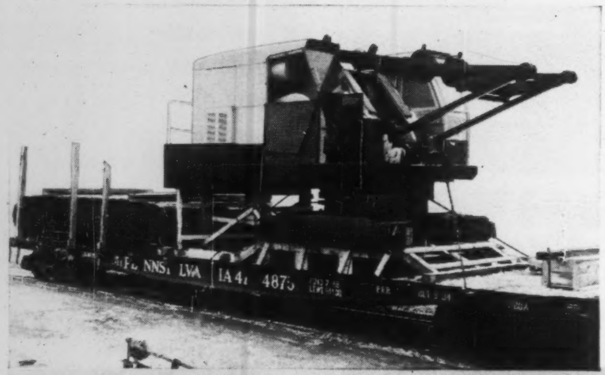
A jaw clutch between the chain drive sprocket and the horizontal propelling shaft enables the side frame to be removed without "breaking" the tread belt or the drive chain. It all comes off in one piece—and goes back the same way.

Easy transportation. The superstructure rests on blocking on car or truck. For fast reassembly, the "880" easily swings the assembled side frames and treads into position so that the slide stub axles may be pulled into them.

Plus other output boosting features. Simultaneous boom derricking or lowering with hoist and/or swing. Square-Tubular-Chord Boom with open-throat boom head to eliminate block fouling. "Joy-Stick" air-power turntable controls. Air-power crawler controls. "Shear-Ball"® turntable connection is warranted for 10 years. Three tread widths: 34", 44", and 48".

These outstanding features are also available on the 70-ton Model 870 crane, clamshell or dragline.

The Thew Shovel Company, Lorain, Ohio



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PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, draglines, clamshells, and hoes from ⅜- to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products sold and serviced by 249 distributor outlets throughout the world.

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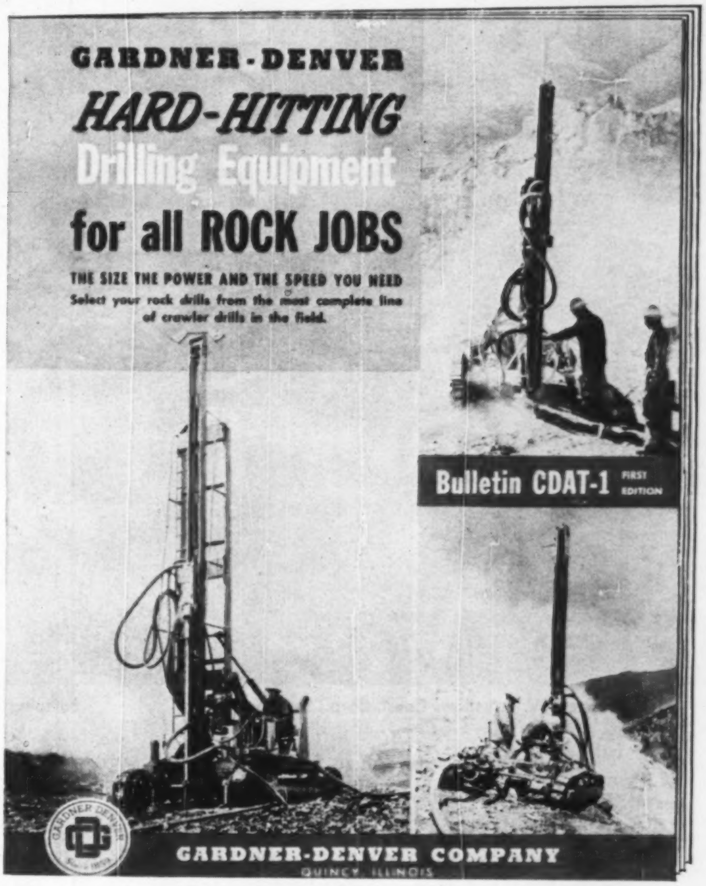
Here's the most complete information on crawler drills ever compiled in one book. At your finger tips are specifications and charts for matching Gardner-Denver carriers, feeds, drills and accessory equipment—tailored to speed the job.

- **5 "Air Trac"® models**
- **Heavy-duty HT143 crawler drill**
- **3 feed masts**
- **4 rock drill models**
- **HI-LEED sectional drill steel**
- **3 bit grinders**



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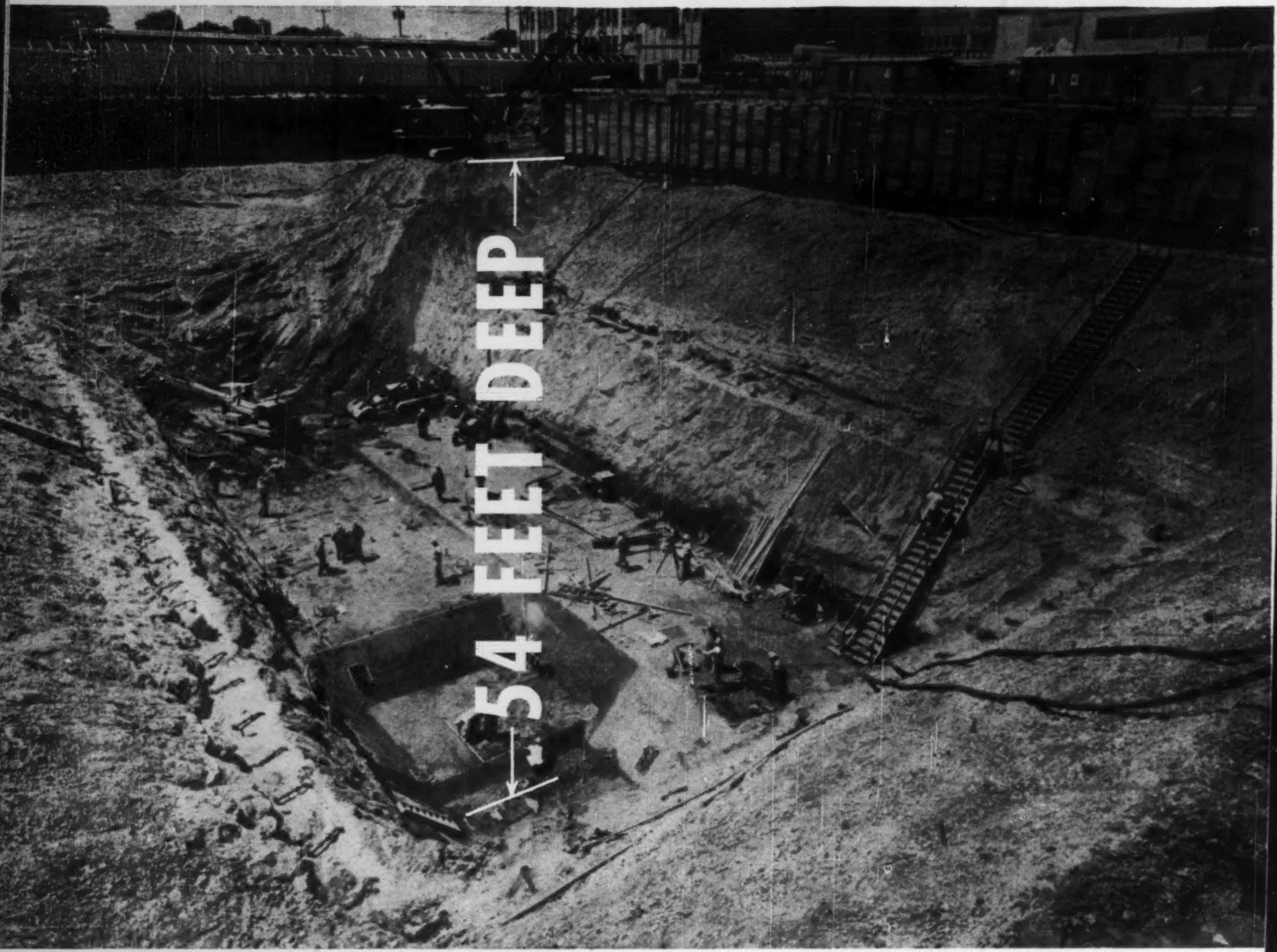
CIRCLE 31 ON READER SERVICE CARD

MORETRENCH PUMPING BONEDRIES FOUNDATION



Contractor: W. S. Bellows Const. Corp., Houston

Pumping Contractor: American Dewatering Corp., Houston

A forty-four story office building for the Humble Oil and Refining Company is being constructed in Houston, Texas, on the foundation pictured above.

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ENGINEERING NEWS-RECORD

Vol. 165, No. 25 December 22, 1960

Number of copies printed in this issue 89,484

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

BEATING BLATNIK TO THE BLAST—In a 161-page report studded with such terms as "low standards of conduct," "self dealing" and "gifts from contractors," Delaware Attorney General Januar D. Bove, Jr. has accused personnel of the Delaware State Highway Department with commission of crimes, illegal spending of public money and general moral laxity.

ZONING CODE APPROVED—New York City last week officially adopted a brand new zoning code—the first for the city since its original pioneering legislation, which dates back to 1916. The new code stresses controls over land use, bulk and intensity of development and parking (ENR Aug. 25, p. 27). It will go into effect in one year.

BARGAIN BRIDGES—California's Division of Highways found what amounted to a $3.5-million Christmas present recently when it unwrapped bids for a project consisting of two bridges and a section of fill for a six-lane freeway. The state had budgeted $10.5 million for the work—but the low bid, submitted by Fredrickson & Watson Construction Co. and Lew Jones of Oakland, was only $6,946,163.

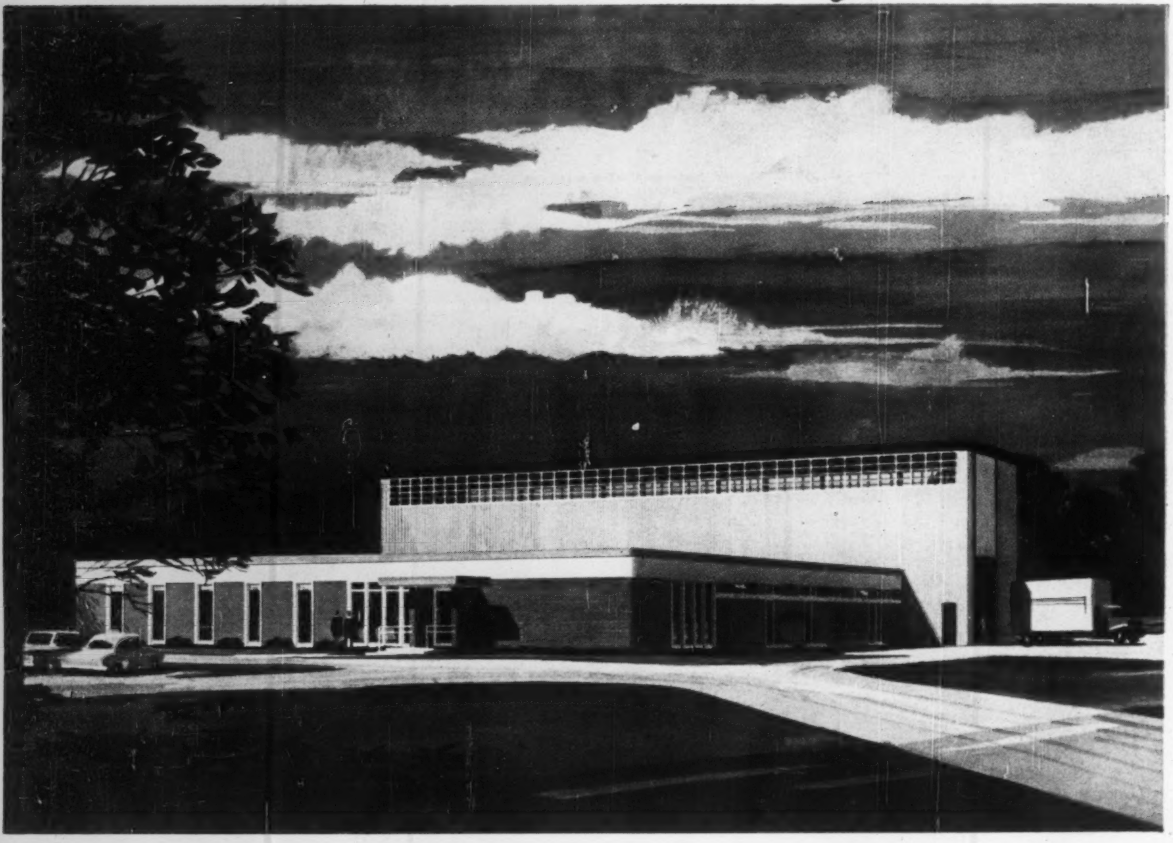
HIGH-PRICED BASES—The construction program for the first Minuteman ICBM got off to a soaring start last week when the apparent low bid for the first Minuteman base came in 55% above the Corps of Engineers estimate. A joint venture of J. H. Pomeroy & Co., San Francisco; Bates & Rogers Construction Co., Chicago; J. Rich Steers, Inc., New York City, and Hawaiian Dredging & Construction Co., Honolulu, bid a low of $78,907,000 for the Minuteman base at Malmstrom AFB, Great Falls, Mont. The estimate for the work was $50,816,560.

HOUSING DIPS SLIGHTLY—November housing starts slackened slightly to a seasonally adjusted rate of 1,235,000 private units, compared to October's rate of 1,253,000. Despite the dip, however, the bulk of October's 16% rate of gain over September was retained in November. For the first 11 months, private starts—at 1,176,000—are off 17% from last year.

HELP WANTED—While most of this year's crop of college graduates will find the job market a bit tighter than last year, private companies plan to hire 6% more engineers, according to a survey conducted by Northwestern University.

NEXT ISSUE: JANUARY 5—ENR will not be published next week. The current issue is the fourth this month, so all regular monthly features have appeared for December. The first 1961 issue will be dated January 5. In the meantime, the editors of ENR wish you a happy and prosperous New Year.

LOCK JOINT PIPE COMPANY *Proudly Presents*



ITS *New*, LARGER AND IMPROVED RESEARCH AND DEVELOPMENT CENTER

Although Lock Joint Pipe Company has maintained its own research and testing laboratory for many years, the Company's growth and insistence on even higher quality products and improved manufacturing techniques have demanded the expansion of these facilities. For this reason it has erected a new research center featuring the latest equipment and staffed with scientists, engineers and trained technicians.

The members of the Research and Development Division, housed in this new half-million dollar center, stand guardian over the high quality of all present Lock Joint products and institute and evaluate future product developments. For it is the Company's firm conviction that only by strict quality control can its products' superiority be maintained . . . and that only through the development of even better materials and more efficient manufacturing techniques can Lock Joint retain its position at the head of its field.

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WASHINGTON OBSERVER

- T-men eye 'payola'
- BPR appointments needed soon

- **Tax troubles will plague Florida roadbuilders long after the recent Blatnik hearings have become a memory.** Internal Revenue Service agents were more than a little interested when contractors said they wrote off as business expenses payments to Florida road department employees.

State employees also can expect calls from tax agents. They told the Blatnik subcommittee they looked upon the payments as gifts and did not report them as income. Hearings produced evidence that five contractors passed out between $54,000 and $75,000, mostly in cash, to 33 state road department employees in 4½ years.

Rep. John Blatnik (D., Minn.) called this close to "bribery." He says he will make a full report on the tax phase to the House Ways and Means Committee. Evidence showed, he said, that the government is losing revenue from payments of doubtful morality.

When the employees were questioned, they said they did no favors for the contractors. There was testimony that soils used in a $2.4-million Tampa project were substandard. Prime contractor was J. L. Cone Construction Co. of Tampa, which made more than $23,000 in undercover weekly payments of $25 to 16 Florida road department engineers.

The subcommittee is studying anti-bribery laws to see whether they need strengthening to bar gifts, particularly cash, from contractors to state road employees working on federally financed projects. Meanwhile, these other recommendations are forthcoming:

- **A code of ethics barring gifts** from contractors to personnel who supervise and inspect their work was suggested by Rep. Fred Schwengel (R., Iowa). The Associated General Contractors already has such a code, but the American Road Builders Association does not.
- **Stiffer penalties for substandard work** were proposed by Rep. William C. Cramer (R., Fla.). Rep. Frank M. Clark (D., Pa.) went further—he suggested contracts be denied builders who have violated state or federal rules.
- **Training schools for state highway engineers** should be conducted by the Bureau of Public Roads, says Rep. Ed Edmonson (D., Okla.), to provide the latest techniques in project supervision and inspection. AASHO will publish a new "information guide" next month in an effort to tighten contract management (ENR Dec. 8, p. 21).

—

- **President-elect Kennedy is under pressure for immediate appointment of his Federal Highway Administrator.** The new Administrator, it is argued, must have time to study three reports due January 3—the day Congress convenes and 17 days before the Kennedy Administration comes to power.

They are: A new estimate on Interstate highway costs; preliminary results from the AASHO road test; and the highway cost allocation study. The last will play a big role in determining possible tax burden shifts.

A city planner is being urged for the Bureau's number two spot. The theory is that a hefty portion of Interstate money is spent in urban areas. Municipal authorities would like to have one of their own in the Bureau to watch out for their interests.

Two more names have been tossed into the pot of prospects for the top federal road job—W. F. Babcock, North Carolina highway commissioner, and J. C. Mackie, Michigan highway commissioner. Others mentioned are Rex Whitton, Missouri chief road engineer; D. C. Greer, Texas state highway engineer; A. E. Johnson, executive secretary, AASHO (ENR Dec. 15, p. 21).

How protection in depth helps cut compensation costs

Had any accidents down on the floor lately?

Working a deep cut can be hazardous business. Noise and congestion team up to cause bodily injuries and raise your insurance rates. Liberty Mutual engineers are experienced in studying work sites and setting up traffic patterns. They know machines and they know men, and they can help you safeguard both to improve your odds against accidents and losses. This safety engineering is but one of the many Liberty Mutual services that add up to protection in depth. To learn more about Liberty's protection in depth and how it can help lower your business insurance costs, contact your nearest Liberty Mutual office.

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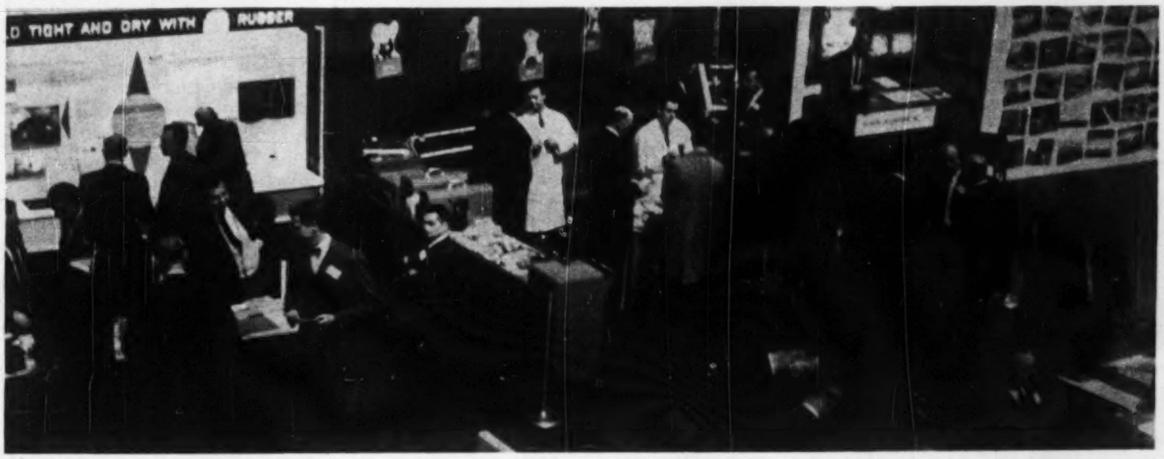
CIRCLE 36 ON READER SERVICE CARD


D TIGHT AND DRY WITH
RUBBER

Plant Builders Shop for Ideas

A new kind of construction conference and show blew into New York City last week along with 17 inches of snow. And considering the weather, designers and builders of industrial buildings turned out in droves to shop for new ideas, materials and equipment.

It was billed as the 1960 Industrial Building Exposition and Congress, and brought shoppers from everywhere.

They listened to one another talk; they examined the merchandise exhibited. And as they did, ENR asked their views on this conference, its displays and prospects for industrial construction.

"Industrial building may well be the sleeper in the building picture for 1961," said Clifford S. Strike, president of F. H. McGraw & Co., New York.

"We'll be needing a new plant within a couple of years," said E. H. Kinne of Rollway Bearing Co., Syracuse, N. Y. "Right now we're wondering how much consultant help to buy and where to go for it. That's why I'm here."

"We're doing a lot of school construction for the government," said Manuel Teja of ECA Planners, SA, Mexico City, "and we're interested in getting into prefabricated housing, too." Mr. Teja was one of half-dozen planners from Mexico City who attended the industrial building show for ideas to speed Mexico's school construction program, which goes heavily to prefabrication.

Said one engineer-constructor who was on the exhibit floor with a fancy booth of his own: "You know, all you've got to get out of a thing like this is one job, and you've made your investment many times over."

Exhibitors of materials and equipment seemed glad they came, despite what the snowstorm did to the traffic past their booths.

"Quality of the inquiries we're getting is very high. They're not just looking; they have real needs, and we should get some good leads out of this," said D. H. Davidson of Timber Structures, Inc., on the second day of the show.

George K. Heebner, Jr., president of the Philadelphia package-builder firm that bears his name, commented, "The show gives close contact among the designer, builder, manufacturer and the customer."

Exhibitors—115 in all—ran from engineer-constructors through material and equipment producers to state commerce and industry promoters, inviting plant construction in their areas.

Visitors and participants came from firms you'd rate from tiny to huge.

Said one exhibitor: "Many of these people are from relatively small outfits. They'll build just one plant in 10 to 20 years and they're ready to do it now. But they don't know where to start. You see them walking in with a big question mark floating over their heads and leaving with a bale of contacts, leaflets and answers."

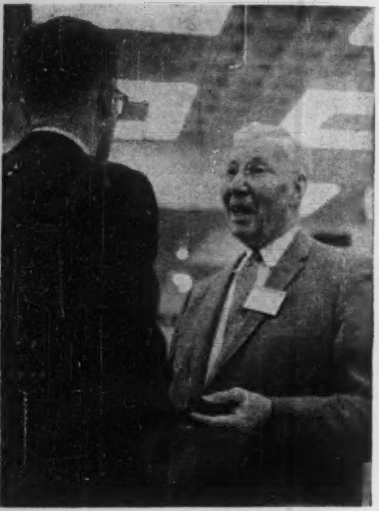
At the other end were the giants.

William F. Reardon, design standards engineer for General Electric Co. in Schenectady, said: "We handle $40 million to $50 million of new plant construction a year. We have to see what's new. We're here for this as well as to take part in the Congress."

(*Turn the page*)

"We want new materials"
. . . says Indian student of plant building.

"We need faster construction"
. . . says Mexican shopper for prefabs.



"You want careful planning" . . .
. . . Lockwood-Greene's Heiser tells prospect.

"Our package is complete" . . .
. . . Lamb's Lamb explains to listener.

"We build for your growth" . . .
. . . Heebner's Heebner tells a prospect.

The congress itself played to as many as five simultaneous technical sessions and produced a potpourri of thoughts:

- Quality—and cost— of your building depends on the designers' skill and knowledge. You waste no money paying for good architects and engineers, said Oscar S. Bray, president and chief engineer of Jackson & Moreland, International, Inc., Boston engineers.
- Wasteful use of expensive land for parking has to be cut or the tail of your plant will be wagging the dog. Frank L. Whitney, vice president of Walter Kidde Constructors, Inc., declared that industry still doesn't understand the car is here, doesn't know how to handle it. Bury your lots in wells, go to simple multiple-deck structures.
- Remodeling old existing plants can be profitable. But it takes special care in planning and won't fit every company's situation. Grayson H. Grossnickle of Westinghouse indicated that one of the best places remodeling can be done is at plants within urban areas. Describing a Newark, N. J., renovation, he said Westinghouse was getting "new" floor space for $7.50 per sq ft in a 75-year-old building and was staying well within its estimated costs on the 300,000 sq ft job. One asset in urban plant renovations: You retain trained workers, eliminating the cost of assembling a new work force.
- Ingenuity in planning will save more money than you realize, Horace D. Gilbert told a plant planning seminar. Mr. Gilbert is president of Miniature Precision Bearings, Inc., Keene, N. H. He told how many companies spend too much on luxury materials. For $30, one of his plants has a marble entrance built of "waste" that local quarries sell for $10 a ton. "And don't gold plate the plant," he said, "keep the design, layout and furnishings consistent with the manufactured product." (MPB received the first of two "Top Ten" plant design awards in 1957 from McGraw-Hill's FACTORY.)
- Once you tell the designer and builder what you want, stay out of their way, warned Du Pont's M. F. Wood, chief engineer. If you're a chemist, make sure you plan for what you need before you start, but then stay in the lab and out of the office. The gain if you do is better construction and design management; the loss if you don't is high costs from late changes.
- If you want full value for your engineering and architectural fees, make sure these people assist during the earliest corporate planning, commented Joseph Rosenthal, president of Engineers, Inc., Newark, N. J.

As the constructors, planners and owners headed home, the sign was already up for the second show scheduled for next September, again at the New York Coliseum.

Lawmakers

Republican and Democratic voices chorused in near harmony last week from the speakers' platform at the National Conference on Water Pollution in Washington. Main points of unanimity: Something ought to be done about polluted streams and legislation is going to be introduced to do it.

A familiar voice was that of Rep. John A. Blatnik (D. Minn.), author of both the 1956 Water Pollution Control Act now in effect and of the sewage grants bill vetoed last February by President Eisenhower. Representative Blatnik declared he will introduce extensive amendments to the act when Congress convenes next month. He will push for greater federal research, expanded federal enforcement jurisdiction over all navigable waters, stepped-up federal aid to communities for construction of waste-treatment plants, and the establishment of an independent agency in the Department of Health, Education and Welfare to handle federal water pollution control programs and activities.

A similar declaration came from Sen. Robert S. Kerr (D., Okla.). He announced he would introduce a much-broader bill on opening day calling for more research. He did not propose a definite figure for federal grants for construction of waste-treatment plants, but it is understood he will call for an increase from the present $50-million-a-year maximum to $100 million. Even this amount is too little, the senator indicated. The vetoed Blatnik bill, HR 3610, originally called for $100 million, but Senate-House conferees compromised at $90 million for a final vote before sending it the last mile to the White House. Senator Kerr borrowed a phrase from President Eisenhower in describing water pollution as primarily a "local responsibility." But, he added, "Both federal and state governments must provide leadership and assistance."

Rep. William C. Cramer (R. Fla.) announced that he too would introduce amendments to the 1956 act. But construction grants are only part of the answer, he said. They have become "the tail that wags the dog," he asserted. Rep. Cramer said his amendments will have four principal objectives: (1) stronger state and interstate water pollution control programs; (2) more effective help to municipalities in sewage-treatment plant construction; (3) more effective control of water pollution by federal installations; (4) a stronger federal hand in abating pollution of interstate waters.

Under the Cramer amendments, the provision for federal grants to state and

Outline New Anti-Pollution Bills

KERR: $100 million a year in grants.

BLATNIK: New agency for pollution.

CRAMER: Stronger federal enforcement.

interstate agencies would be extended; several communities would be able to get individual federal construction grants and then apply them jointly to help build a single treatment plant; all interstate navigable waters and coastal waters would be subject to federal pollution abatement enforcement whether any pollution in question were interstate or not; clean-up orders from the Health-Education-Welfare Secretary would be given more authority; federal installations would be subject to abatement actions by the Public Health Service.

H-E-W Secretary Arthur Flemming took issue with proposals to take pollution control out of the Public Health Service. Some speakers suggested creation of a separate agency, and one proposed cabinet status. Rep. Blatnik's bill is expected to provide for an independent agency similar to the Food and Drug Administration (ENR Sept. 29, p. 23). Although still within the Health, Education and Welfare Department, the new agency would be on a par with the Public Health Service. Secretary Flemming, himself, has proposed some reorganization of PHS.

Conferees Agree on a Few Basics

The acid view and its caustic opposite met dead center and came out an innocuous neutral in many of the final conclusions of last week's National Conference on Water Pollution in Washington. Such diverse factions as manufacturers and sports fishermen reached unanimity on the greatness of virtue and the deplorability of evil but very little else. Substantial agreement was perceptible, however, on a few other points:

- **A benefit-cost system of evaluating pollution abatement must be developed as a basis for sound public policy. Three types of benefits must be considered: health; esthetics, including recreation; and market value.**
- **Industry should get some kind of financial incentive to build and operate waste-treatment systems. Unproductive facilities might be charged off as expense.**
- **Pollution control, along with other water resource development and management, should be planned comprehensively on a basin-wide or area-wide basis. An early objective in planning should be a program of flow regulation. Important industrial sites should be considered to the degree possible.**
- **It should be recognized that pollution sources are rural, as well as urban and industrial. Pollution abatement programs should take into account soil conservation, sediment control and salinity control.**
- **Federal installations should not remain free to pollute streams without regard to local, state or Public Health Service restrictions applicable to non-federal installations in the same area.**
- **Public information on pollution problems and progress should be stepped up to make the citizenry aware of the needs and costs of pollution control measures.**
- **Consideration should be given to financing techniques and sources including the following: federal and state incentive grants; federal guarantees for long-term revenue bonds like Federal Housing Authority guarantees of mortgages or defense loans; a water "RFC" (Reconstruction Finance Corp.) to discount, buy or co-sign bonds; earmarked taxes in a fund somewhat like the Highway Trust Fund, built up from various sources that might include federal license fees for pleasure boats and gasoline taxes now rebated to boat owners.**
- **More knowledge is sorely needed. Neither the extent nor effects of water pollution are as well known as they must be. Known threats are not catastrophic but long-term effects of pollutants may prove dangerous. Research must be expanded to discover better means of measuring pollution and abatement progress, and water sources must be monitored more extensively to keep a check on water quality.**
- **The model water pollution law issued by the Public Health Service in 1950 to guide state legislatures should be revised three ways: (1) Give state pollution control bodies independent status and more authority; (2) authorize courts to direct bond issues, tax levies and revenue charges to insure compliance with cleanup orders; (3) authorize establishment of sanitary districts to work beyond formal city limits.**

Equipment & Materials

While ENR's staff worked in New York through the late fall compiling and interpreting statistics on equipment and materials costs (see p. 50), another kind of staff kept busy at the North Pole and other less romantic places preparing for the seasonal upsurge in

And I want a . . .

dragline . . .

(To help pick up the boulders deposited on the living room floor; more fun than a vacuum cleaner.)

and a crawler tractor . . .

(It runs in forward and reverse under power from two DC flashlight batteries, and is supplied with a bulldozer blade. These machines can pull enough weight for a small boy to do big things with lamps.)

Are High on Santa's List, Too

demand for equipment and materials, junior division. They come in almost as much variety as the real thing.

Since most younger children specialize in moving dirt—particularly into the house—tractors, shovels, buckets, loaders, etc., are in heavy demand.

For older youngsters and younger oldsters there are complicated construction kits—radar antennae, skyscrapers and just plain gizmos.

ENR technical editors who tried some of the more complex projects report they're perfect for children because adult engineers cannot understand the specifications, which are generally composed in a childish jargon called "Clear English."

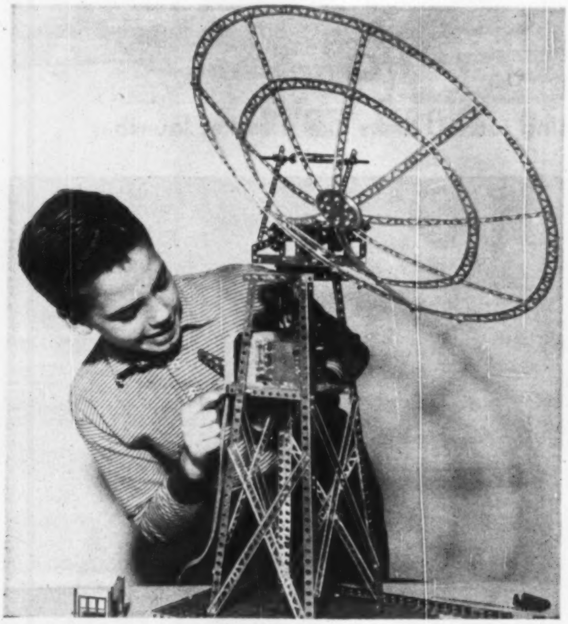
But youngsters speak it well, so these gifts should help provide, for them and you, a Merry Christmas.

and a skyscraper . . .

(Perfect for the budding architect who doesn't care for details—no interior.)

and a gizmo set . . .

(Otherwise known as Tinkertoy. From it can be constructed merry-go-rounds, telescopes, airplanes, buildings and many things resembling nothing.)

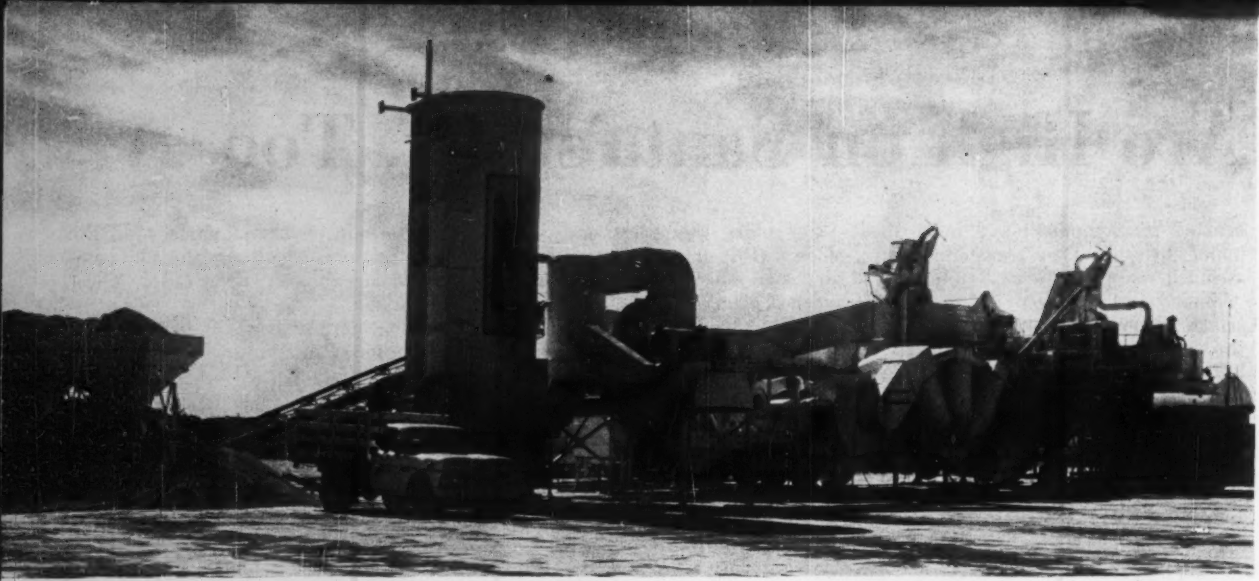


and a radar antenna . . .

(This complex Erector Set offers a healthy challenge to the older youngster and a good workout for Dad.)

and a homebuilding kit

(This model made of precast plastic blocks is probably among the best sellers in today's housing market.)



The big "M" stands for Mobile—and that's just what this 250-tph continuous-mix asphalt plant is.

35 Wheeled Units = One Asphalt Plant

Mobility, capacity and simplicity are claimed as the main features of a 250-tph continuous-mix asphalt plant, which has just completed a 63-mile resurfacing job on Florida roads.

The plant comprises 35 components, all either permanently mounted on semi-trailers or with rubber-tired wheels as an integral part of their own chassis. Most of the components are towed by fifth-wheel tractors; a few, including the conveyors, can be pulled by any heavy-duty truck equipped with a pintle hook.

According to its owner, the plant can be disassembled, moved 100 miles, reassembled, and put in operation in less than 30 hours.

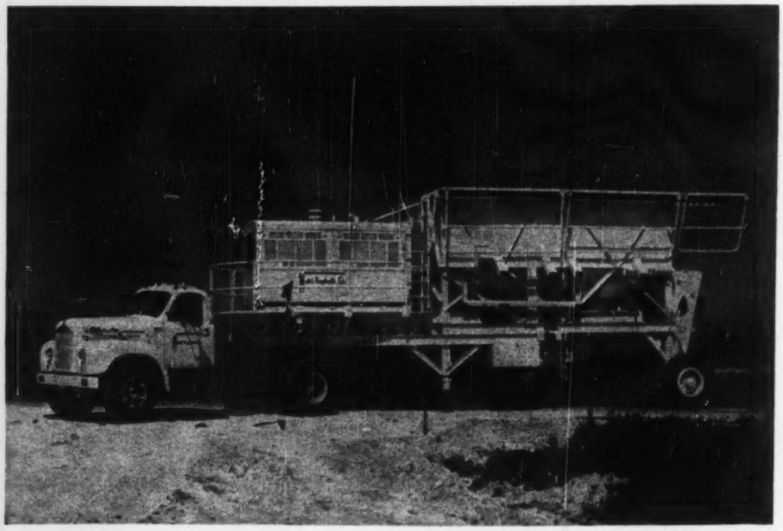
Another important feature of the plant: It is self-contained. In addition to those components usually found in asphalt plants, the plant includes three complete diesel power units, one of which runs a 75 kw generator, a fully equipped machine shop, a testing laboratory, a radio truck and a bunk-house trailer with living accommodations for 12 men, although one man can run it.

The plant was built by the Barber-Greene Co. of Aurora, Ill., for Mobile Asphalt Co., a subsidiary of Fort Lauderdale's South Florida Asphalt Co. Basically, it is B-G Model 848-A plant greatly modified for fast transport and simple erection.

Among the design refinements that speed erection and disassembly are: hydraulic support jacklegs and components; levels mounted permanently on every unit; standardized erection bolts, quick-connect electric couplings to link wiring and panels mounted on all components, and built-in aligning devices for proper set-up.

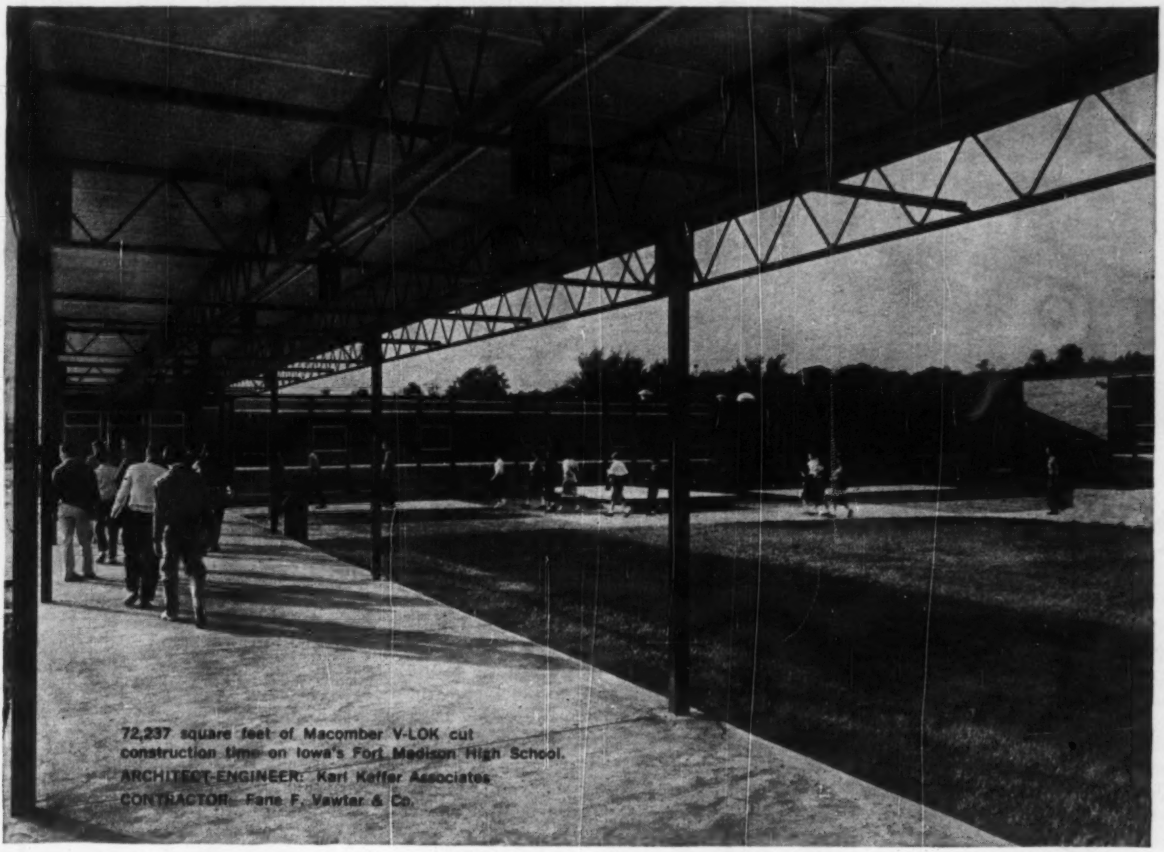
The plant reportedly cost more than $500,000.

Dust collector, being towed, looks like a rocket launcher



Hot aggregate bins and main generating unit are on one trailer.

PUTS SCHOOLS UNDER ROOF FAST



72,237 square feet of Macomber V-LOK cut construction time on Iowa's Fort Madison High School.
ARCHITECT-ENGINEER: Karl Keffer Associates
CONTRACTOR: Fane F. Vawter & Co.

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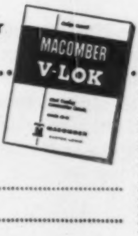

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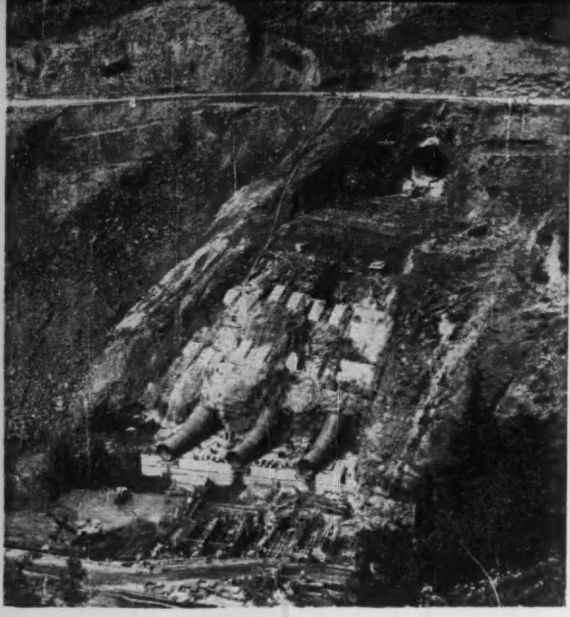
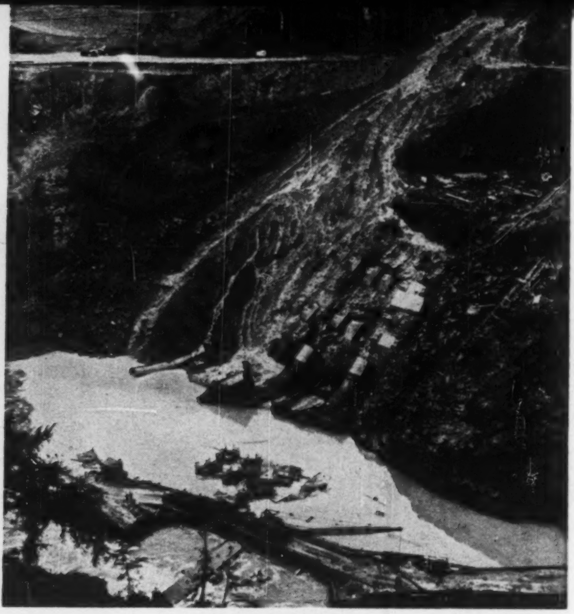


Before . . .



. . . After

Slides, Flood Hit Mayfield Powerhouse

Slides and floods jolted two penstock elbows and flooded the powerhouse cofferdam at the site of the Mayfield hydroelectric generating plant on the Cowlitz River.

Mayfield Dam, upstream from the plant, was unaffected; but work on the powerhouse has been set back 60 days. Damage is estimated at more than $100,000. Just to aggravate the other difficulties, fire has destroyed the concrete batching plant since the slides occurred.

Tacoma City Light's hydroproject has been in trouble of one form or another since before it hit the drawing boards.

The utility has been before the courts since 1953 in a battle against fishing interests, which tried to block construction of the dam. In 1956, the fishermen won out temporarily, and for three years work at the damsite was at a standstill.

Now, however, Mayfield is 60% complete and apparently beyond the reach of a sportsmen-sponsored initiative to prevent construction of dams over 25 ft high on the Cowlitz River and other downstream tributaries of the Columbia (ENR Nov. 24, p. 24).

Until the burned-out concrete plant is replaced, Perini Corp. will buy ready-mix concrete. The firm has been placing at the rate of about 700 cu yd of concrete a day.

Fish ladders and associated facilities to help aquatic life bypass the dam will be provided when the project is completed. The project will include: Mayfield Dam, 185 ft high and 45 ft wide; an 860-ft tunnel, 37 ft in dia; and a 160,000-kw generating plant.

Oval Windows at MIT (for Eggheads?)

A 20-story building, the tallest in Cambridge, Mass., will house the Massachusetts Institute of Technology's earth science facilities in a column-free interior. There will be only four exterior columns at the corners of the building's rectangular plan, which measures 50x 120 ft.

Key elements in the concrete structure are post-tensioned story-height Vierendeel trusses spanning the long dimension of the building and doubling as exterior walls. Clear span is 85 ft, shortened by the long dimension of the massive 3x15-ft columns.

The trusses will have oval window openings about 7 ft high in the webs.

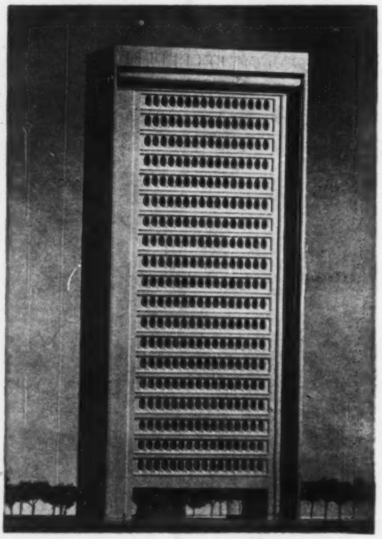
The trusses will be post-tensioned only after the concrete has attained its full seven-day strength of 5,000 psi. Concreting of the columns and 6-in.-thick end walls will follow post-tensioning of the two trusses at each floor level. The columns will be formed around the end bearing posts of each truss, forming a sort of tongue-and-groove pattern. Columns will be cast with 5,000-psi concrete and reinforced with high-strength bars of 60,000-psi yield point.

The reinforced-concrete end walls will act as shear walls, resisting wind loads. Like all other exposed concrete, the exterior surfaces of these walls will receive a light sand-blast finish to expose the finer aggregates.

Architects I. M. Pei & Associates of New York City designed the floor space for flexible layout, achieved through a 5-ft module matched in the spacing of the oval windows. Mechanical utilities are housed adjacent to the end walls.

Severud, Elstad & Krueger, New York City, are structural engineers.

The project will soon go out for bids. Contract award is expected early in February.



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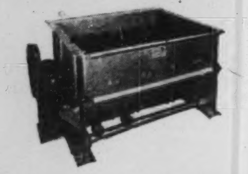

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Around the World . . .

• **Railroad vs roadrail**—Officials of the Chicago Transit Authority and the North Western Railroad are arguing over the plan to put rapid transit tracks in the median of the Northwest Expressway. The North Western is spending $40 million to modernize its adjacent Wisconsin line. The argument is somewhat academic, since CTA has not yet been able to come up with the $30 million necessary to put tracks and trains in the expressway.

• **Penn Center additions**—A $10-million office building for International Business Machines Corp. may add a cylindrical tower to the group of rectangular buildings in Philadelphia's Penn Center strip (ENR Oct. 13, p. 50). Vincent Kling of Philadelphia is the architect. Construction of the $15-million, 30-story Penn Towers apartment building will begin next month. Samuel I. Oshiver & Associates of Philadelphia is the architect.

• **Another link in Big M pipeline**—The San Francisco Bay area's East Bay Municipal Utility District reports a start this month on Lafayette Aqueduct No. 2—a four-mile link in the 88-mile Mokelumne Aqueduct system's third pipeline. Lafayette No. 2 will be 9 ft in diameter and include six tunnels with a total length of 1.2 miles. The third aqueduct will supply EBMUD with an additional 181 mgd of water from the Mokelumne River. American Pipe and Construction, Hayward, Calif., won the $5.3-million award.

• **Dispute over Columbia treaty**—As Canadian and U. S. representatives met last week to begin drafting the formal treaty for development of the Upper Columbia River, a "battle royal" raged north of the border between British Columbia and Ottawa over the degree and terms of the Canadian federal government's participation with the province in the storage projects.

• **Terminal design bids**—Pan American Airways plans to design a new type of air cargo terminal. Characteristics design bidders should consider include modular construction, palatized cargo handling, provision for electronic data processing and the ability to erect "fractions" of the terminal at low-volume airports without leaving the standard pattern.

• **Co-op for planners**—The University of Cincinnati will offer the nation's first co-operative program in city planning beginning next September. Ernest Pickering, dean of the College of Applied Arts, said the five-year program will alternate periods of campus study with periods of related work in government and industry and will lead to a Bachelor of Science in City Planning.

• **Colorado River case**—Decision on the sharing of Colorado River water rests with the Supreme Court now that Special Master Simon Rifkind has denied California's plea to reopen the case. His final recommendations, substantially the same as those he filed for comment in the spring (ENR May 19, p. 25), would give Arizona clear title to water it has claimed in a duel with California.

• **Back to school**—An in-service training program aimed at upgrading efficiency of maintenance employees, inspectors and construction workers has been launched by the Oklahoma Department of Highways. Employees will go to school at division headquarters six hours per day for either six or eight days depending on their classification.

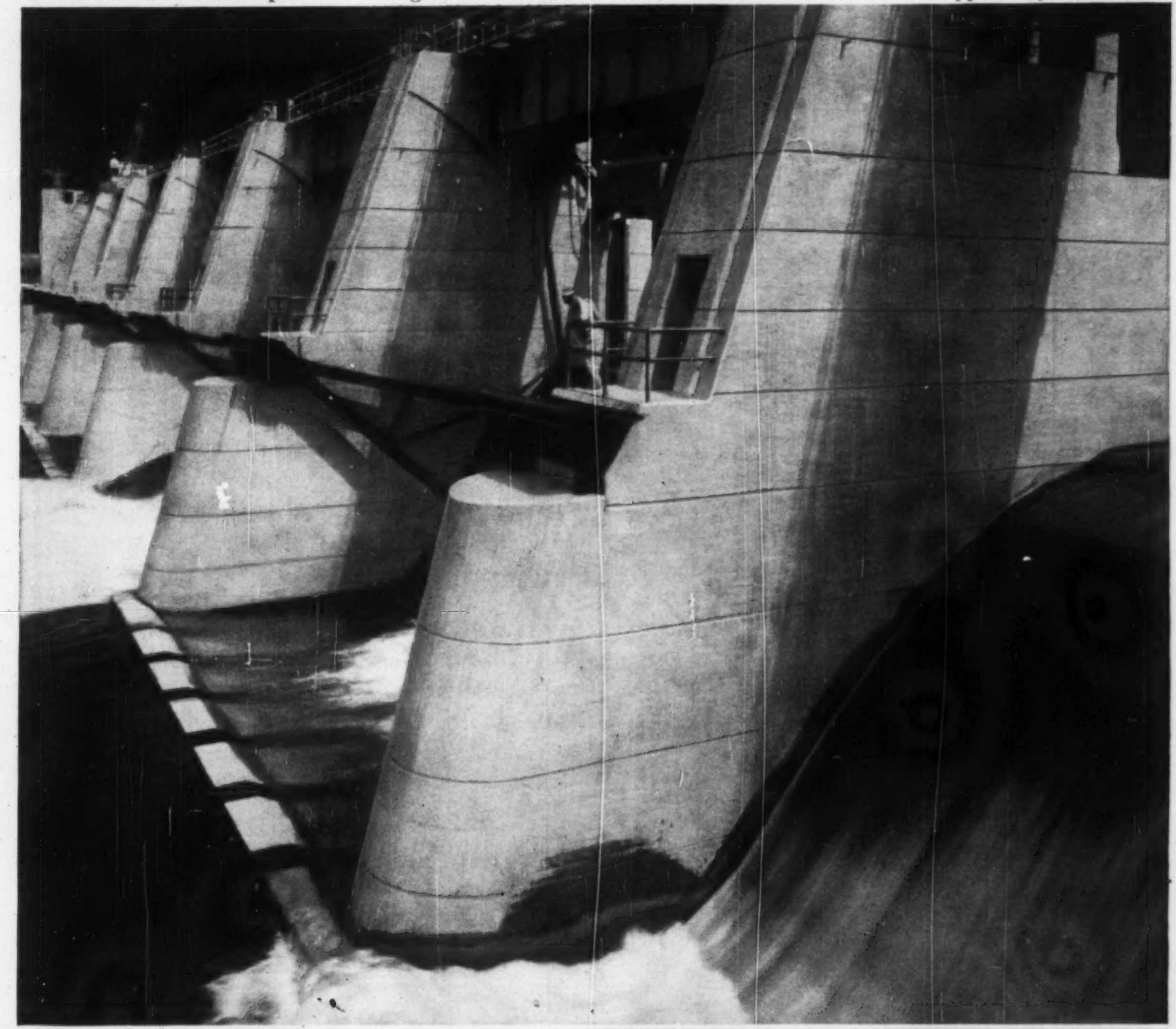
• **For prettier roads**—Architects will be retained as consultants on expressway projects under a policy established by the Seattle Board of Public Works to "help us determine the aesthetic advantage of various layouts or architectural features of structures during the embryo stages of design."

• **Medicine for the meadows**—Soil mechanics experts have proposed filling part of North Jersey's Meadows, a marshland area within site of New York City, for a U. S. Post Office parcel-post distribution center. The 48-sq-mi area, which has been under study by the Meadowlands Regional Planning Board (ENR May 7, 1959, p. 22) might eventually support a population of 5.5 million.

• **Dirt will fly**—Earthmoving operations will get under way next month on the largest single freeway contract ever let in California. Guy F. Atkinson Co. holds a $16.2-million contract to build 7.4 miles of eight-lane freeway from western Los Angeles to Encino, and grade 11.9 through Mulholland Summit.

CONCRETE AID TO SHIPPING...

The recently completed Hildebrand Lock and Dam six miles north of Morgantown, West Va., is the second of three similar installations to improve the navigational facilities of the upper Monongahela River. Pictures show barges going downstream through the locks. The project called for 149,993 barrels of cement, all supplied by Penn-Dixie.



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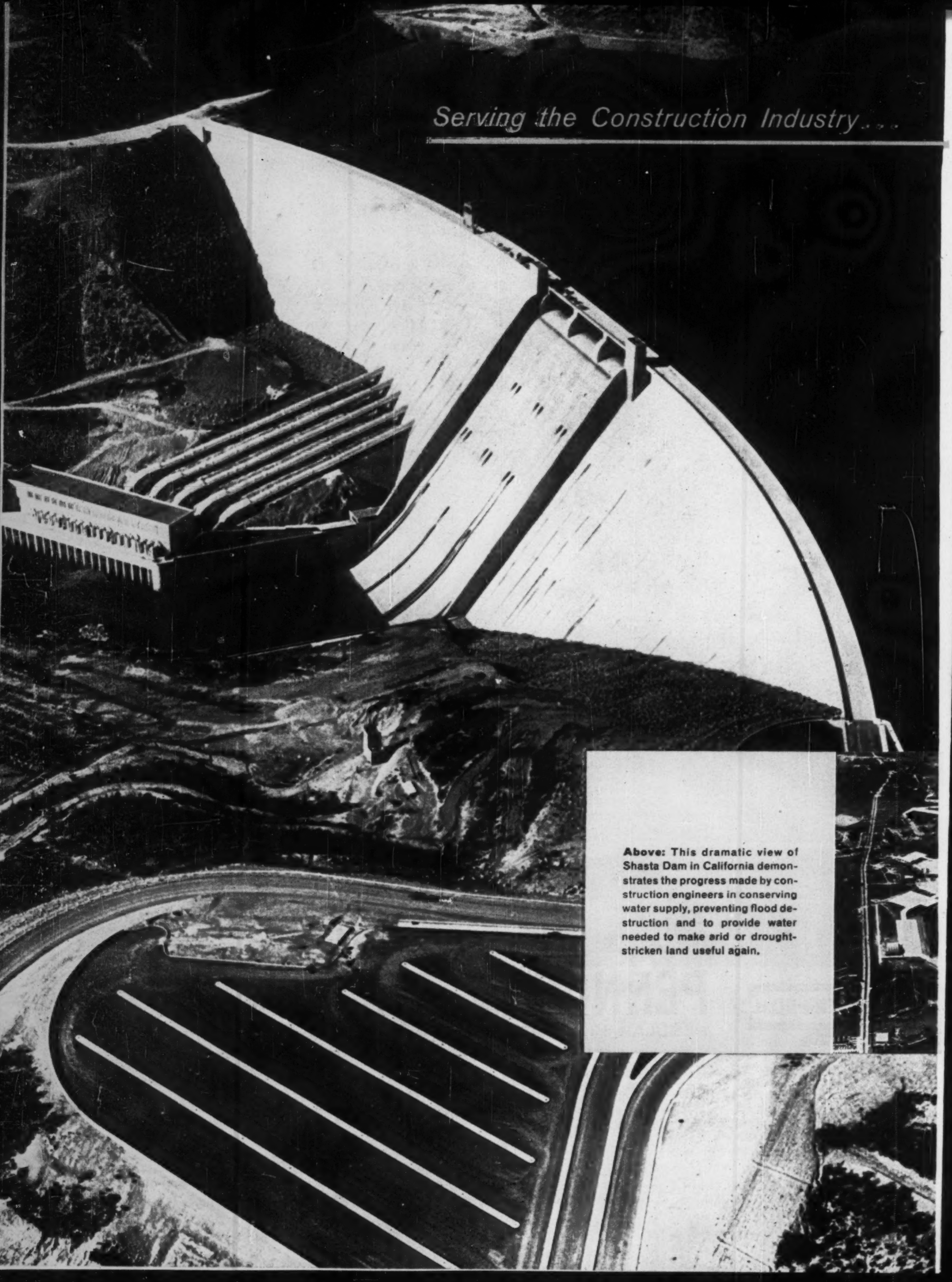

Above: This dramatic view of Shasta Dam in California demonstrates the progress made by construction engineers in conserving water supply, preventing flood destruction and to provide water needed to make arid or drought-stricken land useful again.

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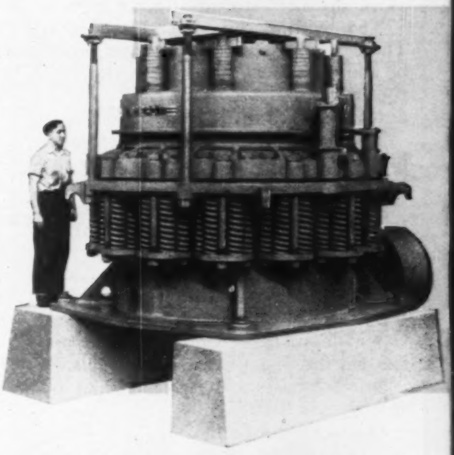

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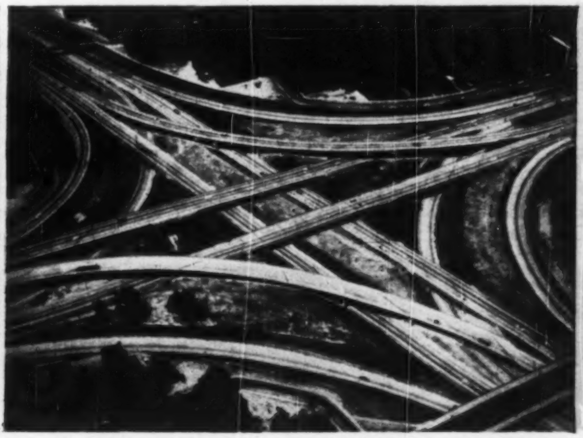

Far left: To meet the challenge of the jet age, engineers and contractors are being called upon to build and expand airport runways to handle the ever-increasing traffic. (View shows Lambert Field, St. Louis).

Left: This view of one of the interchanges on the high speed Detroit expressway is a striking example of the contribution the construction industry is making to the tremendous highway expansion program.

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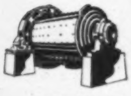

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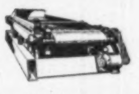

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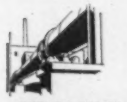
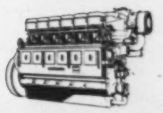


ROTARY KILNS and COOLERS



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4th Quarterly Cost Roundup

Contractors' Dollars

The 1960 cost "honeymoon" is over. After the smallest 12-month increase since 1949, building and construction costs will probably rise faster in '61.

ENR forecasts a 3.8% rise in its 20-Cities Construction Cost Index to a record 862.55 by next December. The 20-Cities Building Cost Index should move up 3.1% to an all-time high of 578.64 within the next 12 months. These predicted 1961 increases would be about half again as large as the 1960 rise in the indexes. The ENR cost indexes are based on 1913 costs as 100.

The faster cost rise will be sparked by a reversal of the stable and lower material price trend of 1960.

In '61 you should look for these major developments on the cost front:

- Lumber prices will reverse their 1960 downtrend.
- Cement prices will move up in a few areas.
- Mill prices of structural steel may rise for the first time in three years.
- Labor raises will be bigger than '60, though less than '59.

Increased southern pine and Douglas fir lumber prices should nudge ENR's U. S. lumber price average 1.5% higher, to $111.50 per Mbf by next December.

A very slight 0.2% increase in ENR's 20-cities average of bulk cement prices to $4.04 per bbl is forecast for '61—cement price increases will go into effect January 2 in a few cities.

The first increase in mill prices for standard structural shapes since 1958 is the keystone in ENR's forecast of higher '61 costs. A 3.3% price hike is forecast, lifting ENR's mill price average to $5.68 per cwt by next December.

These predictions add up to a 2.3% increase in the Materials Cost Component of ENR's cost indexes by this time next year. By contrast, this Component declined 0.7% during the 12 months just ended.

But wages will continue to be the mainspring of the postwar construction cost inflation and exert heavy upward pressure on 1961 costs. ENR predicts that '61 increases will average 12.8 cents an hour for common labor and 15.8 cents for the three key skilled trades in the 20 cities covered by the indexes. These average gains would be fractionally larger than in 1960. These increases would push ENR's 20-cities common labor wage average to a record $2.875 an hour including fringe benefits. ENR's average of bricklayers', carpenters' and structural ironworkers rates should also rise to an all-time high of $4.257 an hour, including fringes, by December '61.

This outlook for 1961 developments in basic materials and labor costs can be considered the most inflationary that can be expected. There remain possibilities that steel makers won't hike structural shape prices next year and that homebuilders won't speed up their operations enough to reverse the slide in lumber prices. But in estimating future costs, prudent contractors will provide for increases that are the most likely development for each of these two key materials.

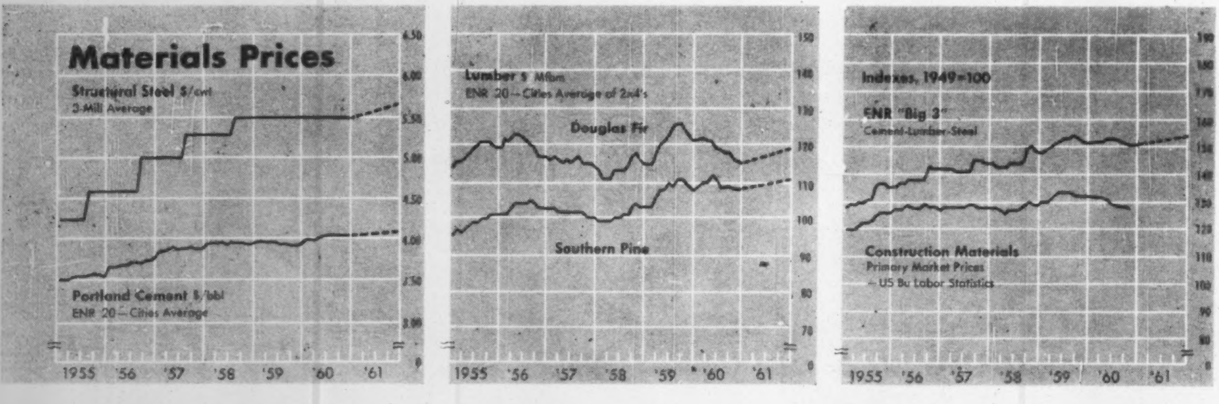
Steel, cement, lumber and other competing products are joined in a long-term battle among themselves for a bigger share of the construction materials market. Price decisions increasingly may reflect management's sensitivity to the possible effects of price changes on their product's competitive position. This competition of the Sixties is also stimulating technological improvements in building materials at an unprecedented pace. The decade ahead will probably be a time when demonstrable improvements in the quality of a material will weigh most heavily in any decision to increase its price.

From the standpoint of fighting construction cost inflation, there is also hope that contractors will have still more success in holding down wage increases when they bargain with construction unions next spring. The many large deferred wage increases that union labor is scheduled to receive next year in many major construction markets (see p. 67) will make this a tough job for contractors, by weakening their bargaining position. But every cent of progress goes a long way toward holding the lid on construction costs. Moreover, to the extent that deferred wage increases are moderated in new long-term contracts signed in 1961, contractors will be strengthening the hands they'll play at the bargaining table in future years.

Construction equipment list prices in 1961 could turn out to be even more stable than their behavior in 1960. Few if any increases are planned between now and April 1, according to ENR's survey of major manufacturers. But what prices do later in '61 will be largely determined by whether steel prices advance and how well new equipment sales do. However, equipment price increases are likely in the second half of the year, probably on a selective basis, except on a very few lines. By contrast, rental rates may ease again in '61 for many types of equipment.

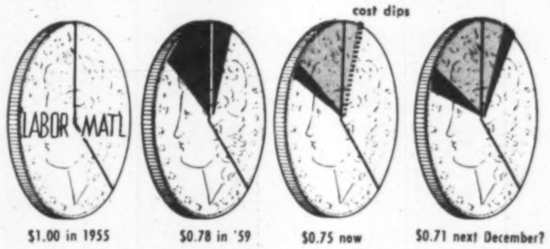
Working capital will be more readily available and its net cost should be less next year than this for contractors with high credit standing. Although aggregate demand for construction loans is likely to rise with the expected uptrend in contract awards, lower demand for bank loans to other industries should ease the credit supply available to the construction industry.

Long-term interest rates have already dropped off substantially from their late

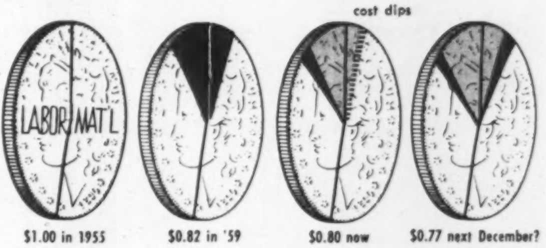


Will Shrink Faster Next Year

How Cost Inflation Shrinks Purchasing Power of Contractors' Dollars



Since 1955, the *Construction Cost Dollar* has lost 25¢ of its 1955 purchasing power . . . This year, it will probably lose 4¢ more

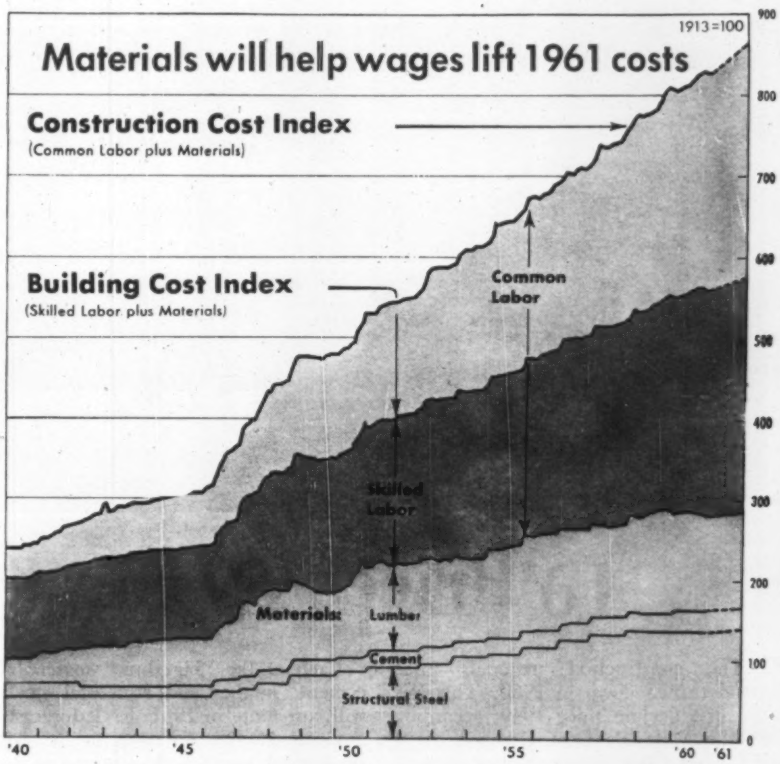


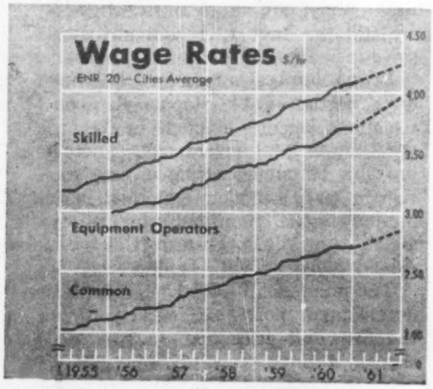
The *Building Cost Dollar* of 1955 is now worth only 80¢ at 1955 prices. By December 1961, it may be down to 77¢

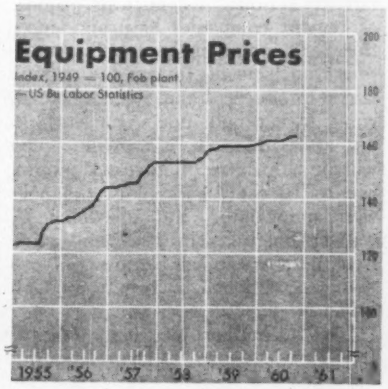
1959 highs. Further easing is possible in 1961, at a slower pace. As industry borrows less for capital spending, other construction buyers can expect to get a better cost break on money they need to finance new state and local public works, commercial building and housing. Lower long-term borrowing costs can mean big savings in total capitalized cost of new construction.

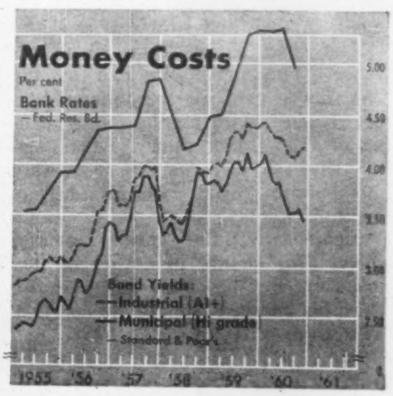
Contractors' selling prices will rise in 1961, under the pressure of increasing labor and materials prices. However, next year's rise should be less than the labor-materials hike because of the more stable trend expected in equipment prices, an easing in money costs and possible increases in productivity of management and labor. Industrial building prices will be among the steadiest, a reflection of the temporary easing in new industrial building contract awards forecast by ENR.

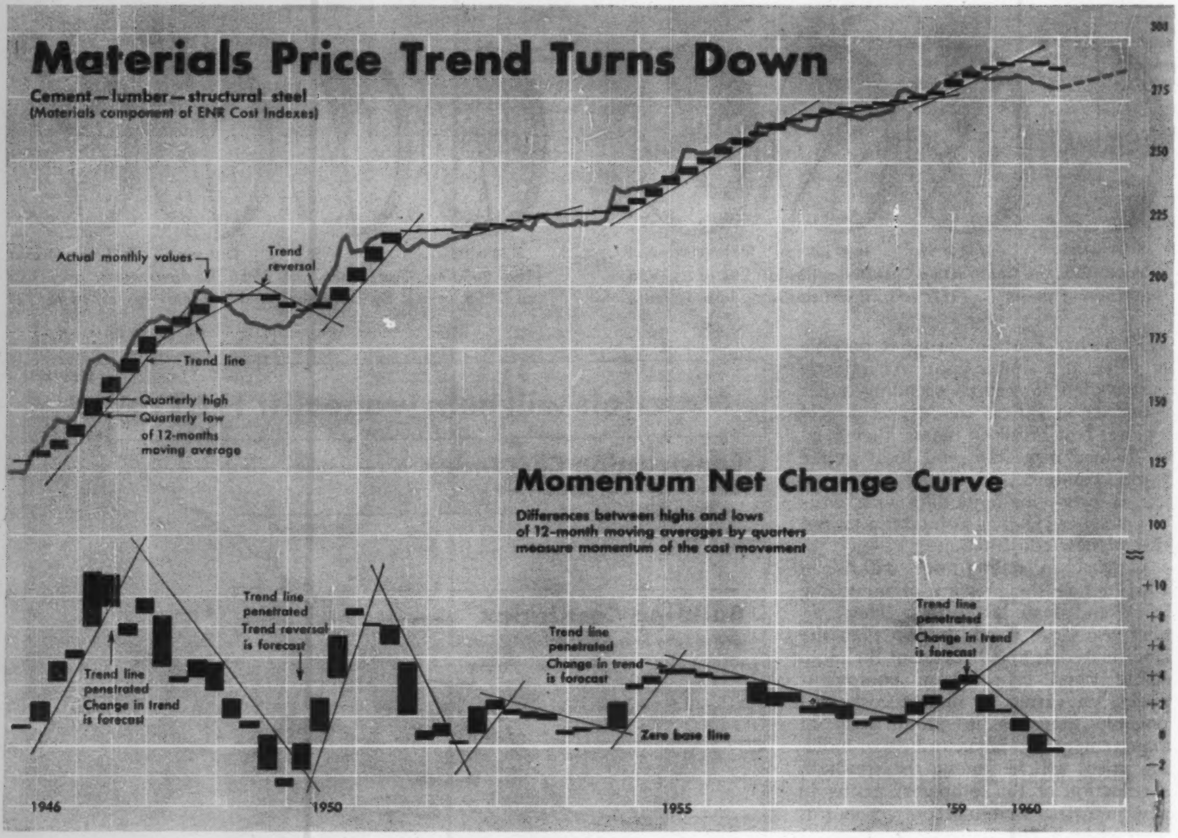
But with total new business rising to the second consecutive annual record, profit margins should take on a healthier hue in 1961. Two factors making for higher productivity of management and labor will help: Ready availability of all key materials and equipment; and wider adoption of the AFL-CIO 10-point work practices code ("Ten Commandments").











Prices of Key Construction

The construction materials price trend turned down in 1960. This was the first decline since 1949, according to the Materials Cost Component of the ENR Cost Indexes, which include the "big 3" materials: Portland cement; lumber; and structural steel.

The chart above flagged it in advance. The signal appeared as the "breakaway gap" in the "momentum net change" block for the fourth quarter of 1959 (lower panel). Later quarters show sharp reductions in upward momentum: finally, downward momentum.

Significantly, the current quarter shows little change in downward momentum. But based on past performance, its message appears to be this: Watch for prices to rise in 1961.

After a 1960 breather, material prices will move higher next year.

Each of the "big three" materials—cement, lumber and structural steel—will cost more in 1961, ENR forecasts.

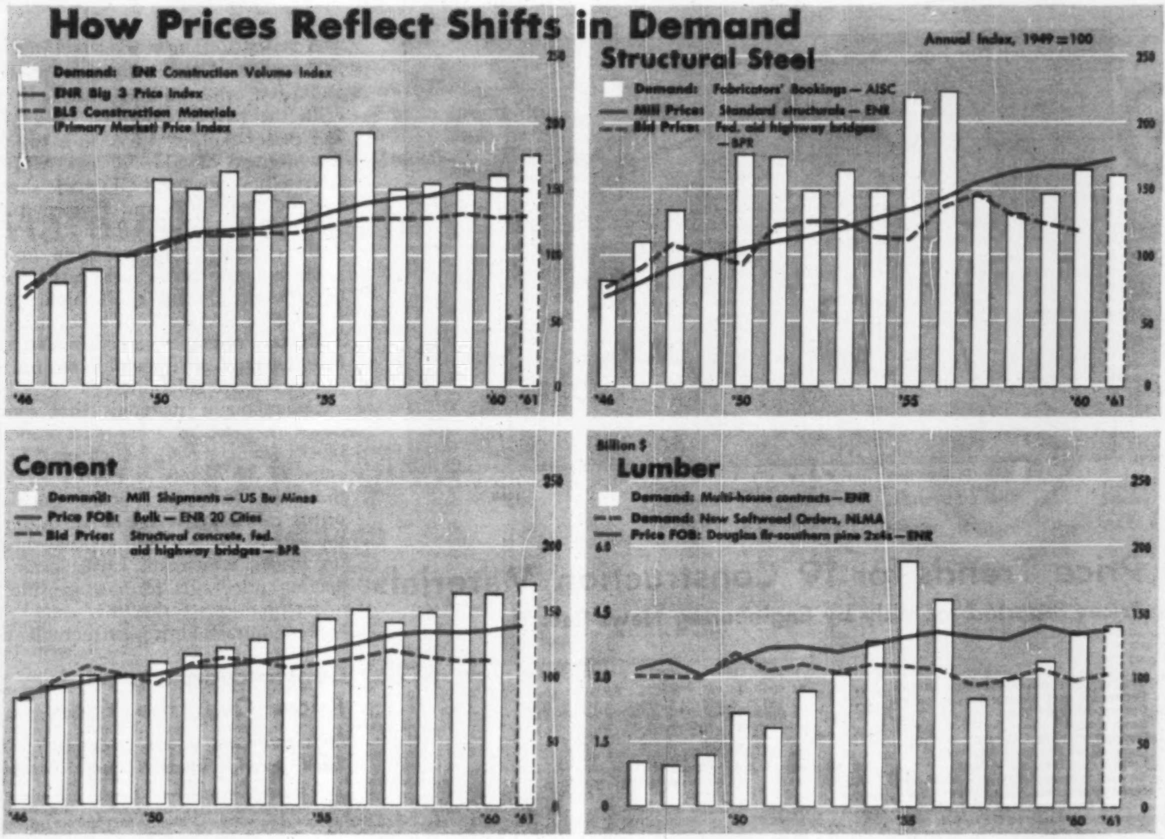
Cement price increases in '61 will be limited to a small minority of the industry's mills. By far the majority of cement companies have announced that they intend to hold bulk cement prices unchanged. In fact the nation's largest producer, Lone Star, is actually going to cut bulk prices 10 cents per bbl at its Norfolk, Va. Mill. There will be a handful of increases running five to 10 cents per bbl in the Midwest and South. But scheduled 25-cent-per-bbl hikes in 1961 mill prices have been rescinded because of "economic conditions" by two major California producers.

ENR's lumber demand indicator (p. 54), a barometer of the relationship between the backlog of orders for Douglas fir lumber and stocks on hand, is showing the first very faint signs of an upturn. This is the result of efforts by West Coast producers to bolster the market by cutting output. This has stiffened mill prices. But yard stocks are still too large to permit any local price increases.

In '61 lumber output will be trimmed further—until stepped-up construction demands enough lumber to draw down local inventories. There'll probably be enough steam in construction to spark a moderate increase in fir lumber prices. Southern pine prices, which generally held firm this year, should move up with fir.

The most significant material price development next year is likely to be the first mill price hike to structural shapes in three years.

On December 1, the steelmakers ab-



Materials Will Move Up in '61

sorbed the second of three jolts from wage hikes under the contract which ended the 116-day strike. But the present soft steel market makes an immediate mill price increase unlikely.

Another strong argument against any immediate mill price hike for structurals is competition from lower priced imports. While total imported tonnage is not large, compared to domestic production, the imports tend to "bunch up" in certain markets and prices react sharply.

Steelmakers may still find the "climate" right for a price increase.

The U. S. economy will be on the rise in '61 and with it will rise the demand for steel, particularly for supplying a burgeoning construction market. With the steel industry's tremendous capacity, this demand will not by itself be heavy enough to lift mill prices. But should the Kennedy Administration pursue generally inflationary economic policies, higher steel mill prices will follow.

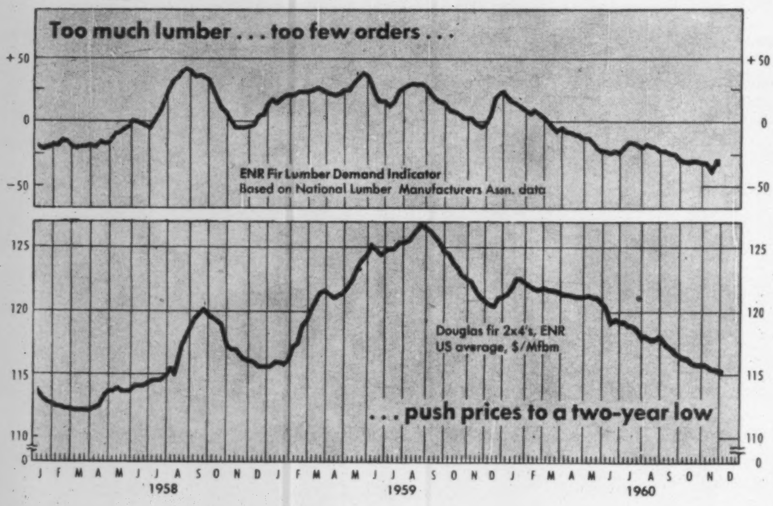
Steel warehousemen, even those worried about foreign steel, look for stepped-up demand to trim inventories and shore up their price structure next year. Steel service centers cut the cost of structural shapes, especially to large contractors, by instituting earlier this year a new system of lower base prices for shape types in heaviest demand and by adjusting "extras" in favor of the large scale buyer.

Profit margins are down but not out, even though the industry has operated for months at barely more than 50% of rated capacity. By using the newest, most efficient facilities, the industry has apparently cut its unit costs enough to absorb higher wage rates. Whether it can absorb next December's wage hike remains to be seen.

An argument against any immediate steel price hike is that the industry does not want to be accused of adding fuel to inflation. But next year, steel companies could hold up a three-year record of price stability and point out that they absorbed most of the wage-fringe increases under the present contract without boosting mill prices.

The factors pointing towards a mill price increase for structural shapes are not so readily applicable to other construction steel items, such as reinforcing bars and steel mesh. These products are the principal targets of foreign competition. And while demand for them will be brisk next year, there should be enough bars and mesh available to make higher mill prices harder to "put across" than in the case of structurals.

Materials Prices



A softer housing market in 1960 triggered price slides in lumber, plywood and a few other building materials.

In the past 12 months, Douglas fir 2x4 prices skidded 5.6% to a two-year low average of $115.90 per Mbf for ENR cities. Plywood CD grade sheathing is down 7.9% and Plyform prices are 8.7% under last year.

By contrast, southern pine lumber prices are only 0.6% under last December's level. During 1960, higher pine prices in a few southern cities reflected a shortage of grade marked lumber conforming to new Federal Housing Administration regulations.

Other major materials that moved down in price in 1960 were concrete blocks (sand/gravel), which cost an average of 8.8% less in ENR's 20-cities than last year; fiber board sheathing prices, down an average of 4.9% during the past 12 months; and gypsum sheathing prices, which are 1.6% lower, reflecting price cuts for raw gypsum by major producers earlier this year.

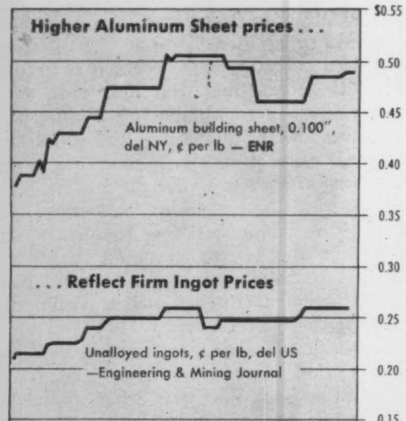
By contrast, brick, structural clay

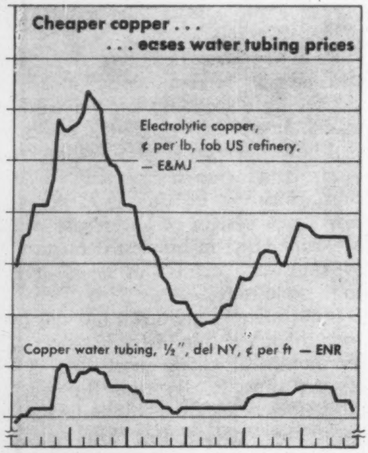
Price Trends for 19 Construction Materials

Prices reported monthly by Engineering News-Record

	November Prices						Per Cent Change
	1955	1956	1957	1958	1959	1960	11/59–11/60
Structural steel (average 3 mills), per cwt	$4.60	$5.00	$5.275	$5.50	$5.50	$5.50	0
Reinforcing bars (average 3 mills), per cwt	4.650	5.075	5.425	5.675	5.675	5.675	0
Cement, bulk, per bbl†	3.356	3.76	3.92	3.95	3.94	4.02	+2.0
Sand, per ton†	2.35	2.418	2.487	2.550	2.467	2.362	−4.3
Crushed stone, 1½", per ton†	2.35	2.793	2.810	2.849	2.694	2.648	−1.8
Lumber, 2x4 Fir, per M fbm†	119.79	117.15	114.60	115.990	122.68	115.90	−5.6
Lumber, 2x4 Pine, per M fbm†	100.97	103.13	100.37	102.75	108.96	108.40	−0.6
Plywood, exterior ⅝", Seattle base price	190.00	148.00	150.00	170.00	160.00	146.00	−8.7
Plywood CD grade, ⅝" int., Seattle base price	......	......	......	......	94.00	86.55	−7.9
Gypsun sheathing, ½"x2'x8', per Msf*	60.61	62.74	63.11	62.88	63.49	62.47	−1.6
Ready-mixed concrete, per cu yd†	12.66	13.41	13.70	13.84	14.11	14.34	+1.6
Fiber board sheathing ½" sq, ed, per Msf*	69.21	69.76	71.30	71.45	73.51	70.66	−4.9
Mineral wool insulation 3' batts, per Msf*	73.71	70.97	71.06	70.46	68.38	67.90	−0.8
Concrete blocks, sand gravel, 8"x8"x16", each*	0.186	0.225	0.229	0.229	0.250	2.28	−8.8
Brick, common, per M†	34.88	37.19	37.59	37.44	39.62	41.02	+3.5
Lime, hydrated finishing, per ton, CL†	30.59	34.80	36.64	36.91	38.71	38.78	+0.2
Structural clay tile, 3x12x12", per M, 2,000 up*	166.05	175.45	182.87	179.92	185.95	188.20	+1.2
Vitrified clay sewer pipe, std 12", per ft†	1.17	1.269	1.312	1.335	1.367	1.408	+3.0
Concrete sewer pipe 12", per ft†	1.04	1.140	1.231	1.264	1.354	1.419	+4.8

* Delivered, trucklots † Fob City, CL





Construction Materials Prices Over the Years

ENR average yearly prices at New York, except steel & cast iron pipe

Year	Brick common per M	Cement per bbl	Lime per bbl	Lumber per M ft bm		Steel shapes per cwt	Pipe cast iron per ton
					*	i	j
1874	$7.41	$1.48R	$1.50a	$26d	....	....	....
1898	6.65	2.25R	.95a	22d	....		
1907	6.16	1.55C	.95a	31d	....	$1.75	$30.75
1913	6.75	1.18C	.915a	25e	....	1.50	21.00
1929	11.71	2.23C	2.25b	65f	....	1.92	38.00
1932	9.75	1.62C	2.25b	40f	....	1.56	30.50
1938	13.10	2.12C	2.80b	59f	....	2.18	44.00
1939	13.46	2.20C	2.80b	64f	....	2.10	42.75
1942	14.17	2.20C	2.80b	86f	....	2.10	45.00
1947	26.38	3.46C	24.34c	116g	113#	2.61	70.96
1948	30.33	4.05C	26.32c	114g	115#	2.98	86.83
1949	33.00	3.32p	26.80c	98g	100#	3.25	86.17
1950	33.50	3.52p	27.10c	132g	133h	3.42	84.84
1951	37.92	3.78p	31.00c	155g	141h	3.65	96.00
1952	36.45	3.84p	32.00c	155g	141h	3.73	97.63
1953	35.33	3.97p	32.00c	157g	139h	3.98	102.60
1954	38.92	4.01p	32.00c	157g	144h	4.16	104.30
1955	41.00	4.24p	33.67c	166g	167h	4.40	106.38
1956	44.00	4.44p	36.75c	171g	174h	4.73	115.12
1957	44.00	4.36p	37.25c	165g	165h	5.14	121.30
1958	44.00	4.29p	39.66c	164.29h		5.37	125.80
1959	44.67	4.69p	39.08c	171.33h		5.50	125.80
1960*	46.00	4.68p	38.00c	169.00h		5.50	125.80

BRICK: wholesale, fob; **CEMENT:** net, delivered •R Rosendale, rest Portland •C in cloth bags delivered (1949-$4.23) price of bags included •p in paper bags, fob city in carload lots. **LIME:** •a common lump, wholesale, fob, 180 lb., net •b 280 lb. •c common hydrated, delivered, per ton (40 bags of 50 lb. ea) no longer quoted per bbl. **LUMBER:** No. 1 common, rough •d 1-in. yellow pine, wholesale at dock •e 3-in. LLYP •f 3x12LLYP from Lumber Trade Jl. •g 3x12 SLYP (LLYP out of market) •h 3x12 Douglas fir fob dealers yard, carload lots. # 3x12 Douglas fir fob rail siding, carload lots. **STEEL:** •i fob Pittsburgh mill. **CAST IRON PIPE:** •j Pit cast, 6" & larger, Cl B or heavier B&S, fob Birmingham, Ala. Starting in 1950, figures also represent price index for average price per foot of 6-in. to 24-in. sizes Class 150 Federal Specification WW-P-421 Bell & Plain End Centrifugal Cast Pipe in 18-ft. lengths; beginning 1955, same sizes but for Class 150 Standard Conditions Pipe, Federal Specification WW-P-421a and ASA Specifications A21.6 (AWWA C-106)
* 11 months average.

Dip With Demand in 1960

tile, concrete and vitrified clay sewer pipe and ready mixed concrete prices were higher during the past twelve months.

The charts at lower left show why contractors should keep an eye on the basic metal markets. Aluminum building sheet prices tend to follow trends in aluminum ingot prices. And copper water tubing prices move with the ups and downs in the market for the red metal. Basic aluminum prices held very firm throughout 1960 after a price increase last year, and building sheets followed suit. The wide-ranging copper market turned down in 1960 and copper water tubing prices also moved lower.

Materials Prices in 22 Cities

Market quotations as reported to Engineering News-Record

	CEMENT, Bulk per bbl CL lots, fob. city Incl. Dealer Disc		SAND, per ton Truck lots or over fob city		CONCRETE READY MIXED 1:2:4 over 50 cy per cy delivered		STRUCTURAL STEEL SHAPES per cwt, base price		REINFORCING STEEL BARS New billet per cwt, base price		LUMBER 2x4, per Mfbm‡ Short Leaf Yellow Pine		LUMBER 2x4, per Mfbm‡ Douglas Fir	
	Dec '59	Nov '60	Dec '59	Nov '60	Dec '59	Nov '60	Dec '59	Nov '60	Dec '59	Nov '60	Dec '59	Nov '60	Dec '59	Nov '60
ENR. U.S. Average	$3.94	$4.02	$2.36	$2.46	$14.13	$14.34	$9.51	$7.91p	$8.38	$8.26	$108.07	$108.40	$120.57	$115.90
Atlanta	3.78	3.88	1.85a	1.85a	13.75	13.75	9.40	7.29lm	8.75	8.75	90.00p	80.00p	......	......
Baltimore	3.91	3.93	2.25ab	2.25ab	13.50	13.50	9.70	9.70	9.00d	9.00d	105.00bo	102.50bo	132.50bl	125.00bl
Birmingham	3.30	3.50	2.13f	2.13f	14.00	14.25	9.00h	9.00n	8.99	8.51c	90.00bdm	92.00bdm	121.00bcn	121.00bcn
Boston	4.52	4.82	3.00bf	3.00bf	15.00	15.00	9.12b	8.21lmo	8.75	8.75	104.00hk	108.00hk	113.00gb	118.00gb
Chicago	3.87	4.02	4.13ac	4.13ac	14.00	14.00	9.15g	6.96lmn	7.16gf	6.70ch	114.00u	111.00u	136.00ui	133.00ui
Cincinnati	4.16	4.34	2.44ad	2.44ad	14.00	15.00	9.56f	7.52lmn	9.04g	8.16g	96.50ad	93.50ad	108.00ag	101.00ag
Cleveland	3.74cd	3.89cd	1.75	1.75	16.50	17.25	8.20	7.35lmn	7.14a	6.75a	102.00b	100.00b	117.00ag	115.00ag
Dallas	3.25	3.25	1.90	1.90	12.50	12.10	10.45	7.71lm	9.00	9.00	80.00x	103.00yb	......	......
Denver	4.29	4.39	1.42ac	1.42ac	11.90	11.90	10.16	8.12	9.25a	9.25a	......	......	122.50kg	118.00kg
Detroit	3.74	3.91	4.25a	2.16h	15.00	15.50	9.25	7.52lmn	7.15c	7.37c	138.00r	142.00r	147.25q	143.25q
Kansas City	3.83	3.92	1.85ab	1.85ab	14.00	14.50	9.82a	8.78m	8.10	8.21	130.00u	120.00u	130.00gu	120.00gu
Los Angeles	4.68a	4.68a	2.41ab	2.41ab	12.46f	12.46f	8.90cd	8.44lm	7.35	7.35	......	......	98.00ik	91.00ik
Minneapolis	4.00	4.17	1.60b	1.60b	14.05d	14.20d	....	7.78lmn	9.26	9.26	......	......	145.00sg	140.00sg
New Orleans	3.65	3.65	2.16b	2.16b	14.00	14.00	....	....	8.00ei	8.00ei	96.00af	90.00af	109.50ae	98.00ae
New York	4.18	4.20	2.30ce	2.30ce	17.60ag	17.60ag	9.84ag	8.02lmo	8.60h	8.60h	122.50bn	118.00bn	123.50bg	118.00bg
Philadelphia	3.99	3.99	1.55ab	1.55ab	13.90h	13.90h	9.10	7.10lmo	8.23	8.23	110.00b	112.00b	128.00bg	125.00bg
Pittsburgh	4.62b	4.62b	3.08bg	3.08bg	15.80	16.15	9.00h	6.96lmn	7.35	7.35	135.00wv	135.00wv	145.00gwv	145.00gwv
St. Louis	3.94	4.04	2.90bf	2.90bf	13.88b	13.88b	9.48g	7.19lmho	7.75a	7.35a	122.00u	119.00u	131.00gu	127.00gu
San Francisco	3.79	3.79	2.12f	2.12f	13.00	13.00	10.80	8.43lmo	9.85d	9.85d	......	......	88.00gv	81.00gv
Seattle	3.60	3.75	4.25ac	4.25ac	13.90e	14.70e	10.20gi	8.30lm	8.85b	8.85b	......	......	75.00ag	67.00ag
Montreal	3.11	3.11	2.40ab	2.40ab	10.80c	10.80c	8.57ei	8.57ei	7.25ijklm	7.25ijklm	84.00tu	83.00tu	......	......
Toronto	4.00	3.84	2.05a	2.05a	13.75	13.75	9.20i	9.20i	7.85	7.40	89.00us	82.00uz	......	......

CEMENT: •a LCL •b fob dealer's yard •c truckload lots •d fob plant **SAND:** •a delivered •b truckload lots •c per cu yd •d 5 tons or more •e barge lots and •f fob cars •g fob dealer's yard •h fob plant **READY MIXED CONCRETE:** •a 5 cu yds or over, del Manhattan •b 10–100 cy •c 1–3 mi zone •d 2000 lb comp •e 2500 lb comp. •f federal tax inc., add 5% mun. & Prov. tax •g 1:2½:3½ •h plus escalator clause •i add 15¢ for ea 1-mi zone **STRUCTURAL STEEL SHAPES:** •a delivered •b 2000–9999# •c 10,000–29,000# •d inc. del in free zone •e add dominion, prov. & Mun. sales tax •f fob city •g 2000–4999# •h add 2% sales tax •i average Canadian & American make •j 30,000# or over •k $8.85 w/o tariff •l base price of type of shape in heaviest demand, item and quantity extra charges to be added •m 10,000# item in 20,000# total order •n add 15¢ per Cwt del •o add 10¢ per Cwt del •p policy of single base price for all shapes discontinued in 1960 **REINFORCING STEEL BARS:** •a 20 tons or over •b intermediate structural •c base price of bar size in heaviest demand •d intermediate or hard grade •e fob city •f add 7.5¢ switch •g inc. 15¢ per Cwt del •h add 15¢ del •i add 10¢ del •j fed. tax exempt •k add 10¢ switch •l 10,000–15,999# fob city •m average of Canadian and American prices **LUMBER:** fir prices quoted on random length (up to 20 ft.), green; pine, on random length (up to 16 ft), green, except as noted •a fob railyard, carlots •b 30,000 bf or more fob lumber yard •c 80% construction grade, 20% standard grade •d all #2 common •e 60% construction grade, 25% standard grade, 15% utility grade, all kiln dried •f 60% #1, kiln dried •g 75% construction grade, 25% standard grade •h hemlock •i all construction grade •j all air dried •k less than 30,000 bf, fob lumber yard •l 85% construction grade, 10% standard, 5% utility grade, 20% air dried, 5% kiln dried •m 40% air dried •n cut from timber at yard •o 5% #1, 95% #2, 10% air dried, 5% kiln dried •p fob mill, •q 20% construction grade, 70% standard, 10% utility grade, 10% kiln dried, LCL delivered •r 90% #2 10% #3, 10% kiln dried, LCL delivered •s 5% air dried, LCL del •t construction grade spruce, 30,000 bf or more del •u 30,000 bf or more, del jobsite •v less than 30,000 bf del jobsite •w all kiln dried •x 30,000 bf or more, #3 common and better, no grade mark, trucked from local portable mill •y 30,000 bf, #2 common & better, grade marked. •z spruce, 85–90% construction grade, 10–15% standard grade.

	BRICK, CLAY BACKING per M quanity delivered		STRUCTURAL CLAY TILE Partition, Scored 3x12x12, per M 2000 pieces or over delivered		GYPSUM SHEATHING ½"x2'x8' per Msf delivered, truck lots		MINERAL WOOL INSULATION 3" batts, delivered truck load lots		CAST IRON PIPE Price Index*		CONCRETE SEWER PIPE 12 in. per ft., delivered		VITRIFIED CLAY SEWER PIPE std. 12 in. per ft. delivered	
	Dec '59	Nov. '60	Dec. '59	Nov. '60	Dec. '59	Nov. '60	Dec. '59	Nov. '60	Dec. '59	Nov. '60	Dec. '59	Nov. '60	Dec. '59	Nov. '60
U. S. Average	$39.61	$41.02	$184.90	$188.20	$63.29	$62.47	$68.38	$67.90	$140.5	$140.0	$1.354	$1.42	$1.48	$1.41
Atlanta	31.50	33.20	170.10f	186.10f	68.00	68.00	70.00	70.00	130.5	130.6	.92e	.95e	1.05	1.04
Baltimore	36.00	36.00	217.00	217.00	55.35a	55.70a	66.50	67.50	140.1	140.2	1.01e	1.01e	1.20	1.20
Birmingham	27.00h	27.00h	135.00f	135.00f	75.00	75.00	70.00	70.00	125.8	125.8	1.25e	1.75e	0.95	0.95
Boston	43.00f	43.50f	232.00b	232.00b	60.00b	55.00b	75.00	75.00	143.1	143.2	1.56ae	1.56ae	1.51ghj	1.55gh
Chicago	32.00	32.00	137.00	137.00	62.00	62.00	80.00	80.00	140.9	140.0	1.30	1.30	1.78d	1.78d
Cincinnati	48.00d	48.00d	160.00e	179.00e	51.16c	51.16c	62.50	60.00	135.5	135.6	.85e	.85e	1.19j	1.26j
Cleveland	41.75	43.25	200.00	205.00	65.00	65.00	72.00	77.00	141.7	141.8	1.35e	1.35e	1.32i	1.27i
Dallas	27.50	30.00	155.00	155.00	56.25	56.25	65.69	65.69	137.8	137.9	1.25	1.27	.96	1.09
Denver	20.00	35.00	170.00	170.00	68.75	67.00	65.00c	65.00c	148.2	145.1	1.05e	1.05e	1.00e	1.00e
Detroit	51.50f	53.00f	242.00	257.00	65.00	66.00	50.00	52.00	142.1	142.1	1.40	1.40	1.86e	1.86e
Kansas City	34.00	34.00	158.00	158.00	.....	.....	75.00	75.00	138.5	138.6	1.60	1.70	1.05	1.13
Los Angeles	38.00a	40.00a	......	......	64.50	64.50	83.00	83.00	148.6	148.6	1.24	1.24	1.78ac	1.78ac
Minneapolis	45.60fg	49.00fg	208.00f	208.00f	75.00	75.00	80.00	80.00	149.9	145.0	2.19b	2.19b	1.73df	1.80df
New Orleans	42.00	42.00	198.00	178.00	60.00	60.00	70.00a	70.00a	133.3	132.4	.95	1.41	1.12	1.08
New York	46.00	46.00	177.00d	185.00d	65.00	60.00	68.50	68.50	138.5	138.6	1.50	1.50	1.63	1.76
Philadelphia	40.00	42.00	202.10	202.10	52.00	52.50	50.00	50.00	137.8	137.9	1.50b	1.50b	1.40	1.40
Pittsburgh	39.00	42.00	200.00g	200.00g	63.00	63.00	55.00b	55.00b	142.9	142.9	1.66	1.66	2.01d	1.27d
St. Louis	44.00	44.00	180.00f	180.00f	70.00	65.00	85.00	70.00	136.9	135.7	1.50	1.75	1.15	1.23
San Francisco	43.00e	43.00e	156.85a	156.85a	61.00	61.00	66.50	66.50	148.6	148.6	1.05	1.05	1.86	1.86
Seattle	52.00b	57.00b	235.00f	235.00f	65.00	65.00	58.00	58.00	149.0	149.0	1.95g	1.90g	1.83a	1.86a
Montreal	48.25c	48.25c	168.78cg	168.78cg	53.00	53.00	66.00	66.00	.....	.....	1.17b	1.17b	2.00k	2.00k
Toronto	25.00	25.00	158.00	169.00	64.50	64.50	65.50	65.50	.....	.....	1.05	1.05	1.50	1.50

•BRICK: •a fob yard •b fob plant, Stockton •c $4.50 del. •d truck load or over •e red face •f truck lots •g sand lime •h 80% common **•STRUCTURAL CLAY TILE:** •a fob plant, Stockton •b fob yard, Roxbury •c smooth •d fob trucks, job site, NYC •e truck load and over •f truck lots •g incl. federal tax **•GYPSUM SHEATHING:** •a full trailer loads •b 10 ton quantities •c fob city **•MINERAL WOOL INSULATION:** •a fob warehouse •b 35# bag •c flame proof $75.00 **•CAST IRON PIPE:** *Price indexes for centrifugal cast iron pipe (includes carload freight allowed to city). These also serve as the historical record of the $ per net ton price of class B, B&S, pit cast iron pipe **•CONCRETE SEWER PIPE:** •a culvert pipe, reinf. ASTM C75-56 •b reinf. ASTM C75-54 •c reinf. ASTM C76-55 •d fob plant •e truck del. •f fob city •g reinforced **•CLAY SEWER PIPE:** •a extra strength •b SS 361-A •c fob plant •d truck del. •e LCL del., fob truck •f listed price based on LCL (no min.) •g ASTM C13-40 •h CL fob origin, freight allowed •i 1 ft lengths •j 3 ft lengths •k CESA A60-1941

IF YOUR DECISION MUST STAND UP FOR 100 YEARS

If your decision today will in some way determine your town's water supply system for the next century, consider the case for cast iron pipe:

- Cast iron pipe is built to *last*—96 American cities will testify to that. They've had cast iron pipe installations in constant use for over a century! And in Versailles, France, they're still using cast iron pipe water mains that were laid in 1664! Solid proof that once cast iron pipe is in the ground, it stays there!
- Cast iron pipe rarely requires repair. Its rugged construction, corrosion-resistant qualities and bottle-tight, rubber-ring joints will withstand the most severe pressures. Once an investment is made in cast iron pipe, it is usually your first and last cost because of the absence of maintenance or repairs.

Don't be fooled by initial pipe costs. You can't save money on "low-cost" pipe if you have to repair and replace it frequently. Insist on the pipe that will actually save you money over a period of years—cast iron pipe!

Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois

Rely on

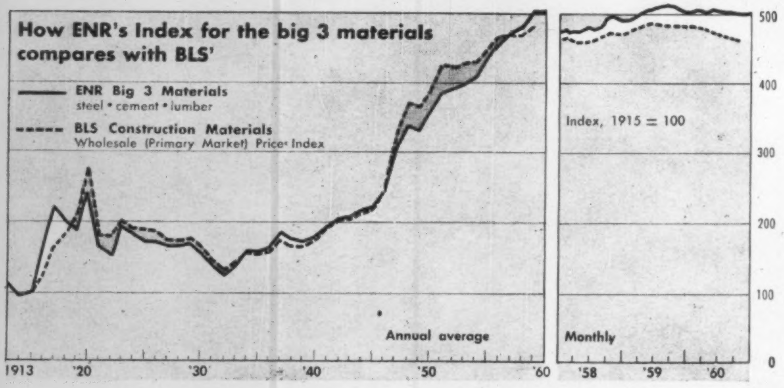
CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE

4th Quarterly Cost Roundup

Materials Prices Indexes — BLS

Most Materials Dropped in 1960



The downtrend in construction materials prices during 1960 pushed the U. S. Bureau of Labor Statistics index of primary market prices for 175 materials 3.2% lower to 130.6 (1947-'49 = 100).

The BLS index declined further than ENR's "big three" component (which was down only 0.7% in 1960) because BLS weights lumber heavily but structural steel very lightly.

Lower lumber prices played a major role in pushing the BLS index lower this year. The sub-index for Douglas fir lumber is down 14.5%.

Building wire, 20% under last year, had the greatest decline of any of the items in the table below. Softwood plywood, only 0.9% below 1959, had the smallest decline. The BLS sub-index for copper water tubing is 18.8% below its '59 value. Nonmetal sheathed cable is down 19.3%. The price index for basement oil tanks is 12.3% lower this year.

Increases in the BLS indexes during 1960 were scattered and they are much smaller than the extreme declines. Among building equipment items, fans and blowers advanced the most, 7%. The price sub-index for aluminum sheets rose 5.8% since last year. Hardwood plywood is 2.1% higher.

Wholesale Price Index, Construction Materials

Bureau of Labor Statistics, 1947–49=100

Annual Average			
1915	27.9	1931	41.2
'16	35.2	'32	37.2
'17	46.0	'33	40.1
'18	51.4	'34	44.9
'19	60.2	1935	44.4
1920	78.2	'36	45.1
'21	50.8	'37	49.6
'22	50.7	'38	47.0
'23	56.6	'39	47.1
'24	53.3	1940	49.4
1925	53.0	'41	53.7
'26	52.1	'42	57.4
'27	49.4	'43	58.0
'28	49.0	'44	60.1
'29	49.7	1945	61.3
1930	46.8	'46	69.1

Year	1947	1948	1949	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Aver	94.0	104.0	102.0	119.6	118.2	119.9	120.2	125.5	130.6	130.6	130.5	134.6*	. . .
Jan.	88.7	100.7	105.4	120.2	117.8	118.5	119.6	122.1	129.4	130.5	130.3	132.4	135.2
Feb	89.9	101.2	104.9	120.7	117.9	118.7	119.2	122.5	129.6	130.5	130.1	133.3	134.9
Mar	91.5	101.8	104.4	120.8	118.0	119.2	119.3	122.8	130.5	130.5	129.4	133.6	134.5
Apr	92.8	102.0	103.4	120.9	118.2	119.9	119.0	123.4	131.3	130.7	129.0	134.7	134.3
May	93.0	102.5	102.4	120.7	118.1	120.2	118.6	124.1	130.8	130.7	129.2	135.8	133.9
Jun	92.8	103.1	101.5	120.0	117.8	120.5	118.5	124.1	130.6	130.7	129.5	135.8	132.9
Jul	93.4	104.5	100.3	119.4	118.0	121.3	120.5	125.7	130.6	131.4	129.6	135.3	132.1
Aug.	94.9	106.7	99.7	118.9	118.6	120.8	120.8	127.4	131.5	131.3	130.6	135.4	131.4
Sep	96.2	107.0	99.9	118.7	118.7	120.4	121.3	128.5	131.0	130.9	132.0	135.0	131.1
Oct	97.1	106.6	100.2	118.7	118.6	120.0	121.7	128.7	131.0	130.2	132.1	134.9	130.5
Nov.	98.3	106.3	100.6	118.5	118.4	119.5	121.9	128.1	130.8	130.1	132.0	134.6	130.2
Dec.	99.2	105.9	101.2	118.0	118.3	119.6	122.0	128.3	130.5	130.1	132.0	134.8	. . .

*Computed by ENR

BLS Construction Materials Price Indexes—1947-49=100

	1947	1948	1949	1951	1952	1953	1954	1955	1956	1957	1958	Oct 15 1958	Oct 15 1959	Oct 15 1960	Percent Change 10/59 10/60	Weight 12/58 %
All Construction Materials†	94.0	104.0	102.0	119.6	118.2	119.9	120.2	125.5	130.6	130.6	130.5	132.1	134.9	130.6	− 3.2	100.0#
Lumber & Wood Products																
Douglas Fir	95.6	109.1	95.3	128.6	127.3	117.2	119.4	130.5	129.9	116.8	114.6	120.1	130.4	111.5	−14.5	.655
Southern Pine	97.2	106.6	96.3	115.7	116.7	115.8	110.7	115.2	119.2	114.6	129.4	130.6	118.6	112.2	− 5.4	.387
Other Softwoods	88.2	106.7	105.1	130.0	128.2	132.6	130.4	136.8	137.4	132.8	129.4	130.6	139.6	123.8	− 11.4	.569
Hardwoods	95.5	107.0	97.4	122.4	112.5	114.8	112.4	118.4	125.9	119.3	119.2	121.7	124.7	124.1	− 0.5	.489
Millwork	87.3	105.1	107.6	130.1	127.0	131.5	130.6	128.7	129.1	128.3	128.2	130.5	138.7	135.5	− 2.4	.569
Plywood, Softwood	88.1	113.5	98.4	121.1	110.3	110.7	107.2	110.3	100.8	91.3	91.8	102.2	89.1	88.3	− 0.9	.190
Plywood, Hardwood	101.3	105.8	92.9	110.8	101.3	108.4	100.3	102.6	104.7	103.7	104.5	104.5	106.3	108.5	+ 2.1	.184
Nonmetallic Minerals																
Portland Cement	91.3	103.0	105.8	116.4	116.4	122.2	126.6	131.4	139.7	146.9	150.6	150.7	152.1	155.1	+ 2.0	.360
Concrete Ingredients*	93.0	101.8	105.2	113.0	113.0	117.4	121.0	124.8	130.6	136.0	139.0	139.1	140.4	142.1	+ 1.2	.736
Concrete Products	96.1	100.8	103.1	112.3	112.5	115.4	117.5	118.6	123.0	126.4	128.1	128.1	130.3	131.0	+ 0.5	.718
Plate Glass	95.2	100.3	104.5	121.0	121.0	126.9	132.0	134.7	141.7	145.7	145.2	144.3	145.0	137.3	− 5.4	.043
Window Glass	95.6	100.3	104.1	118.0	118.0	125.7	131.3	136.8	142.3	145.8	145.5	144.8	145.3	141.2	− 2.9	.113
Gypsum Products	94.5	103.2	102.3	117.4	117.7	121.0	122.1	122.1	127.1	127.1	132.1	133.1	133.1	133.2	+ 0.1	.117
Prep. Asph. Roofing	94.1	103.1	102.8	104.8	102.9	107.3	104.0	106.1	111.7	122.3	112.8	118.5	110.8	106.6	− 3.8	.171
Struct. Clay Products	93.3	101.4	105.3	121.4	122.0	128.1	133.1	140.1	148.0	154.0	156.5	158.2	160.4	162.2	+ 1.1	.337
Insulation Materials	97.4	102.6	100.0	104.1	105.4	107.9	109.6	106.6	101.5	102.8	103.9	104.0	102.9	105.0	+ 2.0	.061
Paint & Paint Materials																
Prepared Paints	98.5	100.3	101.2	109.0	110.4	111.1	112.8	114.5	120.0	126.3	128.3	128.2	128.3	128.4	+ 0.1	.499
Paint Materials	100.6	102.7	96.7	108.8	100.3	96.2	96.3	96.8	99.6	100.5	103.6	102.8	102.6	104.5	+ 1.9	.286
Building Paper & Board	93.0	102.8	104.2	113.4	115.5	121.4	127.7	130.9	136.9	141.5	143.2	143.4	147.6	145.7	− 1.3	.180
Metals & Metal Products																
Structural Shapes	84.4	102.9	112.7	128.4	131.1	138.2	143.8	151.9	162.9	187.5	195.4	199.6	199.6	199.6	0	.226
Bars, Concrete Reinf	87.3	100.3	112.1	123.3	126.7	141.0	153.7	158.8	169.7	184.1	190.8	195.0	195.0	193.4	− 0.9	
Pipe, Black Steel	87.2	102.5	110.3	122.9	125.8	134.7	141.4	150.7	168.7	185.4	191.5	190.9	190.9	187.0	− 2.1	.081
Pipe, Galvanized	86.9	103.8	109.3	124.9	125.1	124.1	128.6	137.1	154.2	163.4	166.4	165.0	166.2	163.9	− 1.4	.115
Cast Iron Soil Pipe	82.4	108.4	109.2	119.9	111.7	107.5	106.3	110.6	111.1	115.3	113.1	113.5	117.5	117.5	0	.052
Copper Water Tubing	96.9	104.1	98.9	121.8	129.3	144.7	138.3	156.5	174.4	151.2	141.8	139.7	149.7	121.5	−18.8	.021
Sheets, Galvanized	90.5	102.5	107.0	132.0	131.8	128.7	131.3	138.8	148.2	152.5	156.6	160.4	161.6	163.4	+ 1.1	.075
Sheets, Aluminum	94.7	99.4	105.9	118.1	120.6	130.0	134.2	142.2	153.1	162.0	163.4	164.6	164.6	174.2	+ 5.8	.142
Metal Doors, Sash, Trim	96.5	100.7	102.8	121.0	117.7	122.6	129.4	139.4	145.6	140.6	141.8	140.1	134.2	131.8	− 1.8	.145
Nails, 8d	81.6	106.4	112.1	126.6	130.1	137.0	141.5	151.9	165.3	177.9	182.2	182.2	182.2	174.9	− 4	.459
Building Wire	103.3	109.6	87.1	116.1	122.4	120.7	93.9	126.6	155.9	132.7	106.1	109.5	137.2	109.8	−20	.070
Nonmetal Sheathed Cable	109.4	109.1	81.4	107.6	111.2	109.1	110.1	96.5	80.8	84.0	75.9	81.5	91.5	73.9	−19.3	.089
Hardware, Finished	92.9	101.1	106.0	125.8	125.4	132.7	139.3	146.4	155.9	164.9	170.8	172.0	173.1	174.6	+ 0.9	.095
Plumbing Equipment	94.7	102.7	102.7	122.6	117.4	116.0	118.4	125.4	133.9	130.2	123.7	124.6	131.0	130.7	− 0.3	.577
Heating Equipment	95.3	101.2	103.6	114.6	113.8	114.8	114.3	115.0	119.0	122.1	121.2	121.4	121.5	119.3	− 1.9	.191
Basement Oil Tank	99.8	106.8	93.4	113.0	113.0	105.8	103.2	111.2	128.1	134.8	134.8	134.8	137.9	121.0	−12.3	.024
Machinery																
Elevators & Escalators	94.5	100.4	105.2	113.5	114.1	115.7	117.8	120.8	128.3	138.3	139.3	138.9	140.0	141.9	+ 1.4	.071
Fans and Blowers	88.7	97.9	113.5	141.7	137.1	138.3	143.7	149.0	166.0	176.3	180.4	180.2	182.2	194.9	+ 7.0	.157

† Includes 175 different materials and types of equipment   * Includes Portland cement   # Percents don't add to 100% because some items included in the index are not shown here

Materials Prices

Monthly Market Quotations By ENR Field Reporters

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over. 3x12x12 In.	4x12x12 In.	8x12x12 In.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over. 8x12x12 In.	10x12x12 In.	12x12x12 In.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper. Carload lot, Hydrated finishing	Common hydrated	Pulverized
Atlanta	$186.10pe	$154.95pkke	$309.90pe	$348.65pe			$33.20uu	$36.70uu	$36.50hh	$28.50hh	$28.50hh
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00	41.00	35.80	23.40	.....
Birmingham	135.00pss	152.00pss	......	303.00p	376.00p	465.00p	27.00ff	38.00jj	38.28mm	20.87mm	26.33gmm
Boston	232.00†mm	248.00†mm	463.25†mm	556.00†mm	.....	......	43.50p	58.00p	42.00§	34.00§	.....
Chicago	137.00ll	149.00ll	280.00ll	......	.....	......	32.00	34.00	1.00llaa	.90ollaa	.....
Cincinnati	179.00mmjvv	190.00jmmvv	355.00jddmm	390.00jmmvv	422.00jmmvv	500.00jmmvv	48.00jk	47.00jk	29.10imm	29.10imm	29.10imm
Cleveland	205.00tt	219.00tt	......	465.00tt	......	709.00tt	43.25tt	47.25ggtt	32.75ptt	28.00ptt	.....
Dallas	162.00	162.00	318.75	387.00	472.50	585.00	30.00	51.00	43.58	25.32	28.00
Denver.....mm	170.00	185.00	310.00	310.00	390.00	442.00	35.00zz	54.00	50.00p	44.00p	46.00p
Detroit	257.00mm	274.00mm	514.00mm	582.00mm	767.00mm	876.00mm	53.50pmm	54.00pmm	38.10mm	30.10mm	40.10mm
Kansas City.mm	158.00	158.00	312.00	312.00	400.00	500.00	34.00	34.00	36.28	34.26	29.76
Los Angeles	r	r	r	r	r	r	42.00uu	.....	38.00nnll	38.00nnll	39.00nnll
Minneapolis	208.00pe	225.00pe	452.00pe	225.00pwe	......	......	49.50vpe	58.00vpe	50.00bbe	40.00bbe	52.00bbde
Montreal	168.78Ruqoo	180.93auqoo	325.00auqoo	220.00qoo	400.00qoo	......	48.25bll	56.30bll	39.00	22.00	13.25
New Orleans	178.00	178.00	371.25	371.25	......	......	42.00	55.00	36.00p	36.00p	.....
New York	185.00h	197.00h	294.00ch	297.00hn	......	......	46.00p	.....	40.00p	38.00p	.....
Philadelphia	208.40ss	222.30ss	416.90sszz	500.20ss	......	......	40.00mm	45.00mm	40.00mmp	21.50	21.50
Pittsburgh...pp	200.00t	213.00t	400.00t	453.00t	607.00t	693.00t	42.00t	40.00t	30.00t	26.00t	34.00t
St. Louis	180.00mmpp	190.00pp	385.00pp	410.00ppp	459.00pp	621.50pp	44.00mmpp	45.50ppR	1.00aapp	.80aapp	1.35zaapp
San Francisco	156.85*mm	177.10*mm	235.30dd*mm	159.40qqmm	......	......	43.00*mm	43.00*mm	29.24mm	29.24mm	31.74mm
Seattle	235.00pt	270.00pt	490.00pt	265.00pwt	......	......	57.00t	71.00t	52.00bbt	38.00bbt	4.50mbbt
Toronto	169.00rr	185.50rr	360.00rr	281.50frr	405.00rr	......	25.00rr	65.00rr	42.00mm	38.00mm	36.50mm

•§ F.o.b. yard. •* F.o.b. plant Stockton. •† F.o.b. yard Roxbury. •a Smooth. •b $4.50 del. •c 8 x 12 x 12 in.-6 cell. •d Pulverized hot. •e less 5% disc., 10th., •f 8 x 8 x 12. •g Lumps, $26.72. •h F.o.b. trucks, job site N.Y.C. •i 80 lb sacks. •j Truck load or over. •k $1.00 discount per M, 10 days. •l Red face. •m Per bb 180 lb. processed. •n 7⅝ x 7⅝ x 12. •o Mason's double hydrated pressure. •p Truck lots. •q Provincial and Municipal tax extra (6%). •r Not used: earthquake danger. •s 8 x 16 x 12. •t less 2% disc., cash. •u Incl. Federal tax. •v Sand lime. •w 5 x 8 x 12. •x dumped. •y Chi common. •z Pebble: 80 lb sack. •aa 50 lb sack. •bb LCL •dd 6 x 12 x 12. •ff 80% common. •gg Smooth. •hh less 25¢ disc., cash. •ii F.o.b. plant. •jj rough: smooth: $40. •kk 3½ x 11½ x 11½. •ll less 2% disc. 10th. •mm less 2%, 10 days. •nn F.o.b., L. A. •oo less 2%, 30 days. •pp add 2% sales tax. •qq 8 x 5½ x 11½. •rr 2½% disc., 10 days. •ss 5% disc., 10 days. •tt less 2% disc., 15th. •uu less 50¢/M. 10 days •vv 4000 pcs. and over. •R revised.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600 lb. (Approx.) bbl F.O.B. Plant Dry a C	WHITE LEAD Per 100 lb. in 100 lb. cases in oil	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$13.75ooJO	$24.00ooJ	$3.59	$3.86	$3.31	$2.90kk	$2.25kk	$2.85kk	$0.67kk	$65.35kk
Baltimore	17.50lpp	24.00	3.00	4.40	3.50	3.06	3.67	4.04	.50	54.00
Birmingham	26.00†J	29.00†J	3.90J	3.40J	....	2.95†mm	2.17ii†mm	3.17ii†mm	.76ffmm	48.00eemm
Boston	24.95†oomm	26.90†mmm	....	....	....	3.30q	2.45o	2.79o	.55o	60.00g
Chicago	15.25rJqqpp	24.00†J	....	....	....	3.45ukk	2.38okk	3.00okk	48.00bbskk	57.70†kk
Cincinnati	15.25†JO	24.00†J	....	....	....	2.74mm	1.88omm	2.42omm	.56ymm	55.96Hmm
Cleveland	25.65†	26.90†	2.59ggP	2.69zggg	3.45ggg	2.65q	1.81o	2.35o	.39y	49.00gg
Dallas	22.50	23.50M	....	3.25B	....	3.00u	3.00o	3.00o	.47o	66.00hh
Denver	23.85n	24.00	3.70	5.10	3.70	2.71	1.93o	2.80o	.50ff	50.00
Detroit	15.75r	24.00rr	2.70mm	3.95mm	2.70mm	2.82mm	1.81ommll	2.23ommll	.56ffmm	49.00mm
Kansas City	26.90lggoo	25.65	3.99	3.43	3.01	3.00mm	2.50omm	2.50omm	.55y	.....
Los Angeles	16.25vy	22.00	3.30n	4.50n	4.20n	3.40nkk	2.40niikk	l	.75nykk	l
Minneapolis	17.25N	21.50kk	....	....	....	2.50kk	1.81hikk	2.36hikk	.52ikk	50.00rkk
Montreal	19.45O	26.00wtt	5.52Dfft	6.55zff	5.10kfft	5.40	4.65f	4.65f	1.60	4.40uu
New Orleans	23.00Jpp	24.00J	....	....	....	2.78	1.98	2.85	.680	45.50
New York	15.75ocO	29.75	....	....	....	2.79zz	1.91zzo	2.46o	.52s	49.00*
Philadelphia	15.75Omm	19.00mm	3.35mm	3.90mm	2.65mm	4.70	3.60	2.36	.74	49.00
Pittsburgh	21.50moqJ	24.00J	2.20#EJ	2.25#FJ	2.25#GJ	2.90eH	2.15sH	2.15H	.56H	55.00H
St. Louis.....K	25.65†m	26.90	....	....	....	3.22iimm	2.35hhK	2.84hhK	.44yK	59.20K
San Francisco	26.70mm	26.90mm	3.20mm	4.30mm	3.50mm	2.87mm	1.72aaiimm	2.59mm	.46jj	54.00
Seattle	13.35HO	24.00H	....	4.19ccffJ	....	3.70ccH	3.06hccH	....	.59cc	.....
Toronto	14.45	20.65	5.15J	6.18J	5.95J	3.50	2.90aae	2.75o	.91j	57.00A

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •* Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Net carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb. keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb roll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •x Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package •ff 5-gal drums. •gg F.o.b. factory. •hh Incl. freight. •ii Per 324 sf of roll. •jj Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. •vv Sept. revised to $12.00. • zz Sept. revised to $2.80. •A 400 lb barrels. •B ASTM Spec. D962-49. •C 95%. •D Std. black. •# Min. spec.: E TTP27; F TTY81; G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •N under 500 lbs, add $1. •O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets (per bag of 4 cu ft)	Plaster aggregate	Concrete Aggregate treated	PERLITE‡ Plaster Aggregate	Concrete Aggregate Untreated	ALUMINUM SHEET† Flat .100" th 36"x108" & 48"x144" per lb jt	Corr roof .032" th 35"x12' per sh u	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96"-120" per cwt bb	28 ga 36"x120" per cwt mm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ⅜" b	½" c
Atlanta	$32.00ss	$42.00ss	$1.55sss	$1.65sss	$1.80sss	$1.65ss	$1.65ss	$0.463noo	$27.17nY	$65.68nzz	$74.43nzz	$0.1762ss	$0.2464ss
Baltimore	24.00	35.70	0.95	1.15	1.15	1.15	1.55	0.462	0.451r	63.00	71.25	0.1600	0.2300
Birmingham	37.00ss	43.00ss	1.55ss	1.55ss	1.60ss	1.27ss	1.27lss	0.459M	9.62K	64.50K	73.00K	0.2000ss	0.2700ss
Boston	24.00	30.00	1.40	1.40	1.40	1.55ss	1.55ss	0.474	25.07pAA	64.42dd*zz	72.67dd	0.1762ss	0.2464ss
Chicago	1.45bbtt	1.45bbtt	1.55	1.60	1.60	1.60	1.60	0.564z	33.43p	64.15ee	72.40ee	0.1580	0.2210
Cincinnati	23.85*ss	23.85*	1.75*ss	1.75*ss	1.85*ss	1.85ss	1.90ss	0.514	9.21	61.00zz	71.25zz	0.1723ss	0.2398ss
Cleveland	28.00N	45.00N	1.14ss	1.16ss	1.24ss	1.45ss	1.45ss	0.459aa	25.07p	63.33oozz	71.58oozz	0.1580	0.2211
Dallas	34.50	34.50	1.05	1.21	1.37	1.21	1.32	0.469	0.484r	64.09	72.34	0.1668	0.1986
Denver	27.00	27.00	1.50	1.40	1.50l	1.50ss	1.60ss	0.475	10.89	65.32gg	73.57gg	0.1670	0.2345
Detroit	28.00ss	28.00ss	1.27ss	1.34ss	1.43ss	1.45ktt	1.50ktt	0.475a	10.35a	63.00azz*	71.25azz*	0.1588	0.2210
Kansas City	30.00	35.00	1.19E	1.21E	1.29E	1.21	....	0.463	24.66ggvvp	67.50E	76.25E	0.1310	0.1480
Los Angeles	27.00tt	28.00tt	1.25ktt	1.20ktt	1.45tt	1.11	1.11	0.459	8.77Z	65.02	73.27	0.1670	0.2345
Minneapolis	35.00F	35.00F	1.65tt	1.80F	1.95Fl	1.40S	1.50S	0.485	16.23	63.61GR	69.61ffG	0.1814	0.2545
Montreal	22.60h	35.60h	1.25h	1.40h	1.60h	1.15v	1.15v	43.95AH	12.10H	65.75H	.....	0.1978BB	0.2450BB
New Orleans	34.00	48.00	1.25P	1.35P	1.45P	1.15P	1.15P	0.463	32.88	61.24Y	72.00Y	0.2058	0.2887
New York	27.00	35.00	1.40	1.35	1.40l	1.35	1.40	0.489aT	0.2507aXAA	64.08a	72.33a	0.1580	0.2210
Philadelphia	26.50	33.00ss	1.40ss	1.25ss	1.45ss	1.05ss	1.05qqss	0.479	10.98	63.71	71.96	0.1480	0.2330
Pittsburgh	30.00nn	31.00nn	1.25nn	1.30nn	1.40mm	1.40nn	1.40nn	0.475	10.39	63.00	74.50pp	0.1600	0.1800
St. Louis....uu	30.00uu	42.00uu	1.50uu	1.60uu	1.65uu	1.50uu	1.60uuY	0.479	8.77	63.39Kmmgg	69.39yuugg	0.1580fmss	0.2210fmss
San Francisco	29.50ss	30.50ss	1.38ss	1.38ss	1.50ss	1.38oss	1.58oss	0.575	10.83	65.00K	77.25K	0.1723	0.2418
Seattle	42.40nn	45.60nn	1.55nn	1.35knn	1.85nn	1.50k	....	0.50D	10.75D	54.02D	73.27D	0.1510	0.1700
Toronto	.82	1.31	1.55	1.50	1.85	1.20Q	....	0.437	26.00ap	73.74	86.52	0.303	0.3418

‡trucklots, delivered †fob warehouse *fob city •a delivered •b ½" O.D. •c ⅝" O.D. •d per sf •e 34" x 60" sheet •f per 100 ft •g 5 tons & up: cold roll, anneal & pickled 2B finish •h incl. Federal tax •i add 25¢ for pint of additive •j 1100 & 3003 alloy, mill finish •k bag of 3 cu ft •l not treated with air entraining agent •m 2-10M ft •n fob mill fr equalized with nearest stocking competitor •o 250 sacks or more •p 100 sq ft •r per lb •s 30 lb bag •t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh •u 19.31 lb/sh •v fob plant •w 48" x 144" •x 0.11"th •y 27 gauge •aa 16M lb & up •bb Per 50 lb bag •dd add $1.00 cwt boxing •ee 4 tons & up •gg add $2/cwt boxing; $0.75/cwt on skids •hh Theoretical wt for 48" x 96"; 60.4-lb. per sh •ii 300-bag lots •jj 100-lb bag •mm Theoretical wt; 19.7-lb per sh •nn 2% cash •oo skid packed •pp type 304 •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •C 15M lb. •D less ½% for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exempt. •K less ½%, 10 days. •L 5% disc. 30 days. •M 3003; .452 for 1100. •N less 2%, 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton. •R revised •S add .10/bag under 200 bags. •T 5000# quantity on 4000# skids. •U 30 Msf quantity; $0.245 in 10 Msf quantity. •X per sq ft. •Y Per sheet. •Z 6,000 lb or over. •AA 30,000 sf or over. •BB Type K

THIS IS MARION QUALITY Let's face it. After all the advertising claims...after the paper work...the cost-and-profit-per-ton analyses...the final acid test takes place here—on the job. So, let's take a look at Marion Quality in action. The job: A huge dam project. The machines: Four Marion excavators with a total dipper capacity of 48 cubic yards. The performance record: MORE DIRT WAS MOVED (BY THE LOAD AND HAUL METHOD) THAN ON ANY OTHER SINGLE EARTHWORKS JOB ANY PLACE IN THE WORLD IN A 24-HOUR PERIOD BY ONE CONTRACTOR! It only proves one inescapable fact. There *is* a difference between promising — and — delivering bigger profit margins. And that's true whether you're interested in high output, such as this construction job demands, or sustained performance on a low cost per ton basis in the copper and iron ore countries. We have the performance figures to back up both. Marion Power Shovel Company, Marion, Ohio. A Division of Universal Marion Corporation.

MARION

Labor and Materials Prices

Monthly Market Quotations by ENR Field Reporters

HOURLY WAGE RATES—Base rate + fringe benefits

	Common Labor									Truck drivers		
	Building	Heavy Const	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrica Workers	Steamfitters	1½ T	under 4 cy	over 4 cy
Atlanta	$2.00	$2.00	$4.00	$3.35	$3.60+7½¢	$3.675	$3.50+3¢	$4.00+5¢	$3.85+22½¢	$2.10	$2.20	$2.45
Baltimore	2.27+7½¢	2.27+7½¢	4.10+20¢	3.60+7½¢	4.00+178¢	3.35/4.05+10¢A	3.85+13¢	3.85+7½¢	3.84+175	2.20+15¢	2.20+15¢	2.20+15¢
Birmingham	1.95	2.05	4.05	3.23	3.65+10¢	3.30	3.37	3.65	3.70+12¢	2.00	2.20	2.45
Boston	2.75+10¢	2.65+10¢	4.05+30¢	3.65+10¢	4.14+20¢	4.05+20¢	3.80+45¢	4.10+25¢	3.95+27¢	2.70+23¢	2.70+23¢	2.70+23¢
Chicago	3.02½+7½¢	3.02½+7½¢	4.225+10¢	3.91+20¢	4.35+16¢	3.90+5¢	4.00+27¢	4.30	4.10+25¢	2.58+175¢	....	....
Cincinnati	2.90	2.80	4.025+12¢	3.90	3.95+10¢	3.575/3.80A	3.875+.01	4.09+.511	4.10+9½¢	2.65+62½¢	2.70+6½¢	2.75+6½¢
Cleveland	3.37	3.285	4.085+10¢	4.11	4.01+10¢	4.11	4.11	4.17	3.91+20¢	2.92+15¢	2.92+15¢	2.92+15¢
Dallas	1.85	1.85	4.10	3.45	3.55+7½¢	3.60	3.875+10¢	3.625+7½¢	3.70+8½¢	1.80/2.625	1.80/2.625	1.80/2.625
Denver	2.32	2.32	4.00	3.60	3.71+10¢	3.25	3.80+12¢	4.05+47¢	3.95+10¢	2.40/2.60	2.75	2.90
Detroit	2.90+34¢	2.90+34¢	3.98+33¢	3.63+46¢	4.00+27½¢	3.63+39½¢	3.75+38¢	4.00+52	3.90+49¢	3.03+175¢	3.03+175¢	3.03+175¢
Kansas City	2.58	2.63	4.075	3.625	3.775	3.57	3.875	3.90+427¢	3.80+9½¢	2.555	2.555	2.63
Los Angeles	3.08+10¢	3.08+10¢	4.20+25¢	3.825+20¢	4.27½+25½¢	3.81+20¢	4.25+42½¢	4.65+46	4.33+64¢	3.365+10¢	3.365+10¢	3.555+10¢
Minneapolis	2.85	2.85	3.875+15	3.50+15¢	3.62+15¢	3.60+33¢	3.65+33¢	3.70+44¢	3.62+37¢	2.85	2.85	3.00
New Orleans	1.92½	1.95	3.72½+7½¢	3.30	3.60+10¢	3.425+7½¢	3.34+5¢	3.90+7½¢	3.80+7½¢	3.425+7½¢	3.375+7½¢	3.375+7½¢
New York	3.45+28¢	3.45+28¢	4.80+60¢	4.55+36¢	4.60+65¢	4.80+38¢	4.70+67¢	4.15+1.25	4.65+61¢	2.35+26½¢	3.40+28½¢	3.40+28½¢
Philadelphia	2.55+10¢	2.60+15¢	4.25+17¢	3.885+15¢	4.45+23¢	3.935/4.215+10¢A	4.15+20¢	4.37½+16¢	4.20+31½¢	2.45+15	2.45+15½¢	2.45+15
Pittsburgh	2.725+20¢	2.55+20¢	4.50+20¢	4.125+20¢	4.30+20¢	3.73+20¢	4.225+20¢	4.60+34½¢	4.20+20¢	2.59+20¢	2.635+20¢	2.735+20¢
St. Louis	2.925+10¢	2.925+10¢	4.05+32½¢	3.875+10¢	3.875+10¢	4.00	4.00+07½¢	4.11+50¢	4.27½+25½¢	2.93+15¢	3.13+15¢	3.23+15¢
San Francisco	3.045+10¢	3.045+10¢	4.40+42½¢	3.725+36¢	4.275+25¢	3.90+35¢	3.79+63¢	4.22+29¢	4.36+72¢	3.79+11¢	3.27+11¢	3.08+11¢
Seattle	3.00+10¢	3.00+10¢	4.15+30¢	3.38+20¢	3.76+10¢	3.84+20¢	3.72+30¢	3.95+27¢	3.89+28¢	3.40+20¢	3.40+20¢	3.60+20¢
Montreal	1.75+4¢	1.75+4¢	2.55+6¢	2.35+5¢	2.55+6¢	2.35+5¢	2.65+6¢	2.45+5¢	2.62+6¢	1.75+4¢	1.75+4¢	1.75+4¢
Toronto	2.00+8¢	2.00+8¢	3.20+13¢	2.95+12¢	3.05+12¢	3.20+13¢	3.20+21¢	3.52+14¢	3.47+13¢	2.05+15¢	2.05+15¢	2.05+15¢

	Tractor Operators Incl. bulldozers			Tractor scraper	Power cranes & shovels		Motor grader oper	Air comp oper	Air tool oper
	34-49 hp	70-100 hp	100 & over	15-16 cy	½ cy	¾ cy			
Atlanta	$3.15	$3.15	$3.15	$3.15	$3.675	$3.675	$3.15	$2.825	$2.22
Baltimore	3.65+10¢	3.65+10¢	3.65+10¢	3.65+10¢	4.05+10¢	4.05+10¢	3.85+10¢	3.25+10¢	2.325+7½¢
Birmingham	3.30	3.30	3.30	3.30	3.30	3.30	3.30	2.89	2.15
Boston	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.90+20¢	3.90+20¢	3.52½+20¢	3.45+20¢	2.80+10¢
Chicago	3.65+5¢	3.80+5¢	3.70+5¢	3.70+5¢	4.25+5¢	4.25+5¢	3.70+5¢	3.55+5¢	3.85+5¢
Cincinnati	3.575+10¢	3.575+10¢	3.575+10¢	3.575+10¢	3.575+10¢	3.80+10¢	3.80+10¢	3.80+10¢	3.80+10¢
Cleveland	3.86	3.86	3.86	3.86	4.11	4.11	3.86	3.735	3.735
Dallas	1.80/2.625	1.80/2.625	1.80/2.625	1.80/2.625	3.325	3.325	1.80/2.625	2.00	2.00
Denver	2.50	3.10	3.10	3.10	3.25	3.25	3.10	3.10	2.60
Detroit	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+39½¢	3.63+395¢	3.03+34¢
Kansas City	2.875	3.325	3.325	3.325	3.57	3.57	3.325	3.325	2.675
Los Angeles	4.11+20¢	4.11+20¢	4.11+20¢	4.21+20¢	4.21+20¢	4.21+20¢	4.21+20¢	3.33+20¢	3.29+10¢
Minneapolis	3.23	3.45		3.45	3.67	3.93+10¢	3.23	3.12	3.00
New Orleans	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	3.42½+7½¢	2.72+7½¢	2.02½
New York	4.175+33¢	4.175+33¢	4.175+33¢	4.30+34¢	5.05+40¢	5.05+40¢	4.30+34¢	4.30+34¢	3.90+.195¢
Philadelphia	3.63+10	3.775+10	3.775+10	3.90+10	4.345+10	4.345+10	3.765+10	3.51+10	2.40/2.50+10¢
Pittsburgh	3.72+20¢	3.72+20¢	3.72+20¢	3.72+20¢	3.92+20¢	3.92+20¢	3.92+20¢	3.43+20¢	2.80+20¢
St. Louis	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.45	3.45
San Francisco	4.01+35¢	4.01+35¢	4.01+35¢	4.14+35¢	4.31+35¢	4.31+35¢	4.21+35¢	3.48+35¢	3.475+10¢
Seattle	3.81+20¢	3.81+20¢	3.81+20¢	3.81+20¢	4.18+20¢	4.18+20¢	3.90+20¢	3.54+20¢	3.20+10¢
Montreal	1.95+4¢	2.18+5¢	2.18+5¢	2.18+5¢	2.45+5¢	2.45+5¢	2.18+5¢	2.05+5¢	2.05+5¢
Toronto	2.45+10¢	2.55+10¢	2.55+10¢	2.50+10¢	3.05+12¢	3.20+12¢	2.85+11¢	2.55+10¢	2.55+10¢

ENR Skilled Labor Average (Bricklayers, Carpenters, Iron Workers): $4.099, ENR Common Labor Average $2.747

Description of fringe benefits last appeared Sept. 22 1960. •A 1-2 drum.

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft		GYPSUM BOARD LATH plain or perf per Msq ft	GYPSUM SHEATHING tongue & groove per Msq ft	FIBER BOARD SHEATHING asph impreg & coat per Msq ft		FIBER BOARD INSULATION sq edge, paint per Msq ft	MINERAL WOOL INSULATION		GLASS FIBER INSULATION		ALUMINUM FOIL	
	½"	⅜"	⅜" x 16" x 48"	½" x 2' x 8'	½" sq ed	25/32" T&G	½"	loose, per 40-lb bag a	3" batts per M sf	loose, per 40-lb bag a	3" batts per M sf	80# Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq ft
Atlanta	$65.00F	$55.00F	$42.50F	$68.00F	$72.00F	$127.00F	$75.00F	1.59z	$70.00F	$2.00	$80.00F	$4.77qi	
Baltimore	54.00	47.50	35.75	55.70	65.00	108.50	69.00	1.40F	67.50F	1.60F	47.00F	4.00F	$33.50F
Birmingham	68.90H	57.00H	47.77H	75.00H	67.50H	140.50H	83.50H	1.40	70.00	2.00	65.00	3.77gG	......
Boston	60.00mH	50.00mH	35.00mH	55.00mH	65.00H	120.00H	79.00hnH	1.40bH	75.00H	......	75.00H	5.30zHS	53.50qH
Chicago	67.00	54.00	45.00	62.00	87.00	123.00	87.00	1.85	80.00	......	63/65	5.25j	
Cincinnati	52.50wH	42.85wH	33.05wH	51.16wH	77.00wH	125.00wH	72.50wH	1.45wH	60.00wH	1.45wH	60.00wH	2.85jwJ	50.00wJ
Cleveland	62.00CF	56.50CF	41.50CF	65.00CF	80.00CF	129.00CF	80.00CF	1.35	75/80H	......	67.00	14.00iwJ	55.00J
Dallas	56.25	46.85	42.50	56.25	68.75	118.00	68.75	2.00	70.00	1.75	70.67	5.00gAG	45.00
Denver	62.50H	51.50H	43.00H	67.00H	62.50H	103.50H	77.00	1.55b	65.00ub	2.00b	65.00a	5.25	48.65
Detroit	66.00K	56.00K	42.45K	66.00K	48.50DK	85.65DK	62.50DK	1.30b	52.00	1.85b	80.00	......	....
Kansas City	72.00H	62.00H	45.00H	.....	75.00H	122.00H	80.00H	1.40H	75.00H	1.80H	75.00H	3.60d	60.00
Los Angeles	Q 66.00F	60.50F	0.33xF	64.50F	75.00F	125.00F	80.00F	76.00BeF	83.00F	1.35s	64.00	4.65g	7.90V
Minneapolis	P 75.00F	65.00F	0.41xL	75.00F	95.00F	130.00F	78.00F	2.25yF	80.00F	2.10F	80.00F	4.25F	......
Montreal	58.00M	49.30M	37/41.50M	53.00M	64.75M	......	58.50M	1.50M	66.00M	1.50M	66.00M	9.00qM	56.00M
New Orleans	57.00H	52.00H	45.00H	60.00H	67.00H	140.00H	80.00H	3.00L	70.00*	......	......	......	62.50U
New York	65.00H	55.00H	42.50H	60.00H	78.00	124.00	78.00	1.55b	68.50k	......	......	4.38iH	40.00cH
Philadelphia	H 53.00	45.00	36.50	52.50	65.00	115.00	65.00	1.20	50.00	1.40	50.00	2.90	83.50
Pittsburgh	74.00K	65.00K	40.00K	63.00K	60.00K	100.00K	60.00K	1.25sK	55.00K	1.25sK	55.00K	4.25iqK	38.50K
St. Louis	55–65.00HO	50–55.00HO	40.00HO	65.00HO	65-75HO	115/120HO	75/80.00HO	125/135	65-75HO	2.00PHO	74.00HO	4.39iqHO	......
San Francisco	60.00F	49.00F	0.36xF	61.00F	70.00F	111.00F	69.00F	1.75F	66.50F	1.75F	66.50F	5.10	60.00F
Seattle	68.00K	58.50K	51.50K	65.50K	65.00K	125.00K	71.00K	1.15tK	58.00K	1.90*pK	51.00*lKh	4.25K	46.50EK
Toronto	58.00	50.00	46.50L	67.50	79.00T	.....	88.00T	1.85	60.50	......	60.50	15.00o	46.00

•* F.o.b. warehouse. •a Semi thick. •b 30# bag. •c 3 layers of foil: $54.50. •d 40# kraft paper, 5 Msf, 100/500 rolls. •e 20# sq ft bag, 4" thick. •f Full trailer loads. •g 80# kraft paper backing 400 rolls or over. •h LCL. •i 40#. •j 80#. •k 2-in. •l 2". •m 8 to 10 ton quantities. •n Distributor's siding. •o Per Msf roll. •p 32# bag. •q 500 sf. •s 35# bag. •t 26# bag •u Flame proof $75. •v 5000 sf quantity. •w F.o.b. city. •x Sq. yd. •y 30# bag. •z Spun rock wool. •A 650 sf. •B ton. •C F.o.b. plant, freight allowed. •D CL. •E 10 Msf. •F less 2% disc, 10th. •G ½ of 1%, 10 days. •H 2% disc, 10 days. •J 1% disc, 10 days. •K less 2% for cash. •L 5% disc, 10th mo. •M fed. tax incl. •N 1% disc, 10 days. •O add 2% sales ax. •P 50 lb. bags, •Q add 4% sales tax. •R revised. •S 45 lb. •T less 2%, 30 days. •U lots of 2606 sq. ft. •V 250 sf roll.

MEXICO CITY WAGES & PRICES

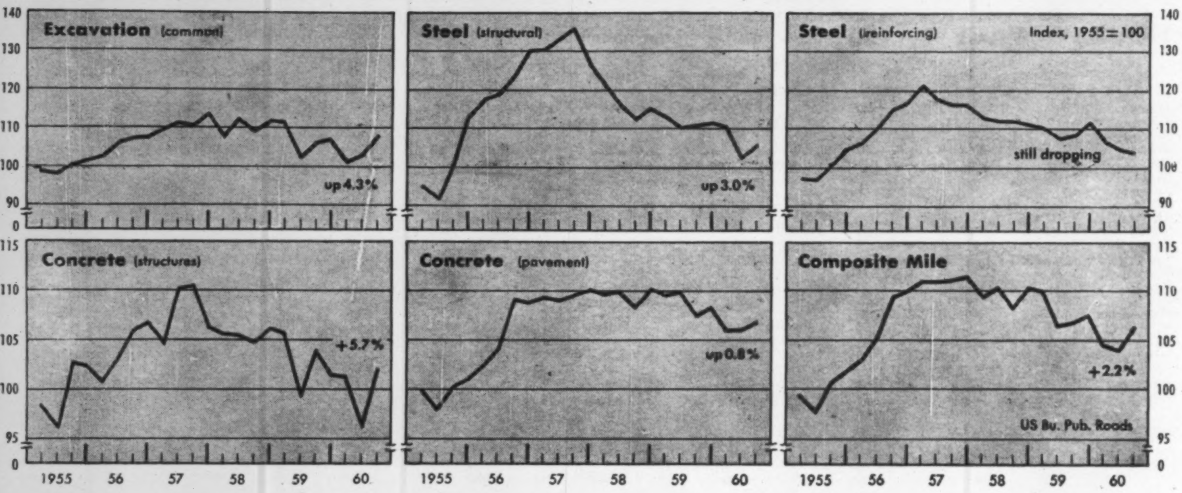
WAGES, av per week, 8 hr day (pesos)a		Dec. '60
Common labor,	building (peons)	101.50
	heavy const (peons)	136.50
Skilled labor;	carpenters 1 cl	210.00
	bricklayers 1 cl	245.00
	struct. ironworkers	315.00

•a 6 days work-extra day's pay

MATERIALS PRICES, F.o.b. City (pesos)	Dec. '60
Struct. steel shapes, fob Monterrey	
I-beams, 3 x 3 x 4" per metric ton	1942.10
Reinf. steel, corrugated rods, per ton	
⅜"-½" x 11 meters consolidada	1925.00
¾"-1" x 11 meters	1800.00
Gravel, truckload, per cu meter	
Blue gravel	30.00
Cement, std. port. (Tolteca) per metric ton	255.00
Lumber, 2" x 4" 1st class pine 20 ft. per M sq. ft.	2700.00
2" x 4" 2nd class pine per M sq. ft.	2300.00

Heavy Construction Cost & Price Indexes

Highway Bids



Highway Price Indexes in Nine States and the U.S.

Reported by state highway departments — US Bureau of Public Roads Indexes, 1925-29 = 100

Base Year = 100:	California H'way 1940	California Bridge 1939-40	Colorado 1949	Idaho 1950	Michigan 1940	Nevada 1955	Oregon 1940	South Dakota 1940	Texas '49-'53	Washington 1940	Excavation ¹ 17,491* cy Price $0.35†	Excavation ¹ Index 100.0	Surfacing ² 3,726* sy Price $2.22†	Surfacing ² Index 100.0	Structures: Reinf. steel 16,000* lb Price $0.052†	Structures: Struct. steel 4,325* lb Price $0.067†	Structures: Struct. concr. 68* cy Price $22.15†	Combined Index 100.0	Composite Mile Index 100.0	ENR Construction Cost Index 100.0
1955 Av.	205.7	228	81.4	113.3	181.9	100.0	162.3	177.0	97.0	181.9	0.36	101.9	3.67	165.3	0.116	0.165	51.99	232.8	152.8	318.8
1956 Av.	247.3	265	92.8	118.3	185.4	118.2	193.8	198.8	105.0	214.1	0.38	108.2	3.89	175.5	0.131	0.202	54.33	253.8	163.3	334.6
1957 Av.	264.3	283	97.3	116.1	173.0	124.3	187.8	205.6	108.2	226.4	0.40	113.5	4.02	181.2	0.137	0.218	56.92	267.0	170.0	349.8
1958 Av.	236.5	267	96.1	96.4	171.1	113.3	174.6	184.5	115.3	211.4	0.39	112.5	4.02	181.1	0.130	0.193	54.92	253.3	167.5	366.8
1959 Av.	239.7	260	92.9	93.6	163.7	104.6	176.3	200.7	111.0	194.0	0.38	108.1	3.99	179.9	0.127	0.184	53.42	246.5	164.6	385.1
Q1	216.1	245	97.2	108.9	163.0	110.0	201.4	216.9	117.0	189.0	0.40	113.4	4.02	181.3	0.128	0.187	54.93	251.2	167.6	377.6#
Q2	270.4	260	92.5	88.4	164.1	102.4	165.4	194.1	112.1	194.6	0.37	104.8	4.03	181.7	0.125	0.182	51.90	240.7	163.1	385.0#
Q3	260.3	262	89.3	77.5	163.8	105.7	165.4	215.5	109.1	194.9	0.38	108.6	3.94	177.6	0.126	0.183	54.05	247.1	163.4	392.3#
Q4	229.1	253	93.0	99.6	163.2	106.2	172.8	191.2	106.5	195.4	0.38	109.4	3.97	179.0	0.130	0.184	52.80	246.9	164.4	390.1#
1960:																				
Q1	219.8	237	88.1	103.8	170.8	101.2	167.3	208.2	110.9	192.8	0.36	103.7	3.89	175.4	0.124	0.182	52.75	242.6	159.9	393.0#
Q2	251.6	...	92.8	103.6	174.5	111.0	182.7	195.8	106.0	190.1	0.37	105.7	3.89	175.4	0.122	0.170	50.30	233.1	159.1	399.4#
Q3	229.1	257	92.3	102.7	183.8	115.6	176.4	247.5	114.6	210.7	0.39	110.3	3.92	176.7	0.121	0.175	53.11	240.4	162.6	401.5#

*¹ Common excavation plus other expressed as equivalent common excav. *² Portland cement concrete plus other expressed as equivalent port. cem. concr. ** Fixed quantities used for establishing price trend. *† Prices for base year index. *# Last month of quarter. Based on 1925-29 = 100.

Irrigation and Hydro Cost Indexes

US Bu Reclamation, 1949-51 = 1.0

Class of Construction	July 1940	October 1946	October 1949	October 1958	1959 Jan	1959 Apr	1959 Jul	1959 Oct	1960 Jan	1960 Apr	1960 Jul	1960 Oct
Composite Index	**0.47**	**0.84**	**1.02**	**1.26**	**1.28**	**1.27**	**1.27**	**1.26**	**1.27**	**1.24**	**1.25**	**1.25**
Dams, earth	0.51	0.98	1.05	1.10	1.12	1.12	1.12	1.12	1.13	1.10	1.07	1.07
Dam structure	....	....	....	....	0.99	0.99	0.99	0.99	0.99	0.95	0.91	0.91
Spillway	....	....	....	....	1.27	1.27	1.27	1.26	1.28	1.25	1.23	1.23
Outlet works	....	....	....	....	1.34	1.34	1.35	1.34	1.36	1.35	1.35	1.35
Dams, concrete	0.47	0.81	1.02	1.12	1.13	1.13	1.13	1.13	1.14	1.12	1.12	1.12
Dams, diversion	....	....	....	....	1.37	1.39	1.37	1.39	1.39	1.39	1.39	1.39
Pumping plants, building & equip	0.48	0.76	0.97	1.46	1.47	1.47	1.48	1.48	1.48	1.44	1.46	1.44
Structure, rein conc, & improv	0.53	0.75	1.00	1.33	1.33	1.33	1.33	1.33	1.34	1.29	1.31	1.29
Equipment	0.56	0.77	0.94	1.63	1.65	1.66	1.67	1.70	1.70	1.70	1.71	1.68
Pumps & prime equipment	....	....	0.94	1.71	1.73	1.75	1.76	1.78	1.78	1.78	1.79	1.76
Accessory elec & misc equip	....	....	0.97	1.49	1.50	1.50	1.51	1.54	1.55	1.55	1.56	1.55
Steel penstocks, discharge pipes	....	0.69	0.94	1.69	1.72	1.74	1.75	1.77	1.77	1.77	1.78	1.78
Canals	0.47	0.86	1.02	1.13	1.13	1.12	1.12	1.11	1.11	1.06	1.11	1.11
Earthwork	....	....	....	....	1.09	1.06	1.06	1.06	1.06	1.01	1.06	1.06
Structures	....	....	....	....	1.24	1.19	1.14	1.16	1.16	1.12	1.16	1.16
Conduits (tunnels, conc-lined)	....	0.82	0.97	1.29	1.29	1.28	1.28	1.26	1.26	1.24	1.26	1.26
Laterals & drains	0.41	0.76	1.01	1.30	1.32	1.30	1.30	1.28	1.28	1.23	1.28	1.30
Earthwork	....	....	....	....	1.11	1.05	1.05	1.00	0.97	0.92	0.97	0.98
Structures	....	....	....	....	1.59	1.52	1.50	1.46	1.46	1.41	1.46	1.48
Power plants, hydro, bldg & equip	0.51	0.78	0.96	1.49	1.51	1.51	1.52	1.52	1.52	1.50	1.50	1.50
Structure, rein conc & improv	0.45	0.78	1.01	1.34	1.34	1.34	1.34	1.34	1.34	1.29	1.31	1.30
Equipment	0.55	0.78	0.93	1.60	1.61	1.62	1.63	1.65	1.65	1.65	1.63	1.63
Turbines & generators	0.56	0.80	0.94	1.62	1.64	1.66	1.67	1.68	1.68	1.68	1.65	1.65
Accessory electrical equip	0.54	0.73	0.92	1.52	1.52	1.52	1.53	1.56	1.56	1.56	1.56	1.55
Miscellaneous equipment	0.51	0.73	0.95	1.44	1.44	1.45	1.46	1.48	1.49	1.49	1.50	1.50
Concrete pipe lines	....	....	....	1.32	1.33	1.35	1.36	1.36	1.36	1.36	1.36	1.36
Switchyards & substations	0.54	0.76	0.94	1.60	1.61	1.62	1.63	1.64	1.65	1.63	1.65	1.60
Transmission lines—												
Wood-pole, 115-kv	0.52	0.99	1.11	1.23	1.23	1.21	1.23	1.23	1.25	1.28	1.28	1.26
Poles and fixtures	....	....	....	....	1.10	1.13	1.16	1.09	1.12	1.13	1.13	1.10
Overhead conductors, devices	....	....	....	....	1.34	1.34	1.34	1.34	1.35	1.39	1.39	1.39
Steel-tower, 230 kv	....	....	....	1.43	1.44	1.44	1.45	1.46	1.46	1.48	1.48	1.48
Primary roads	0.48	0.82	1.06	1.23	1.24	1.25	1.25	1.24	1.25	1.25	1.25	1.23
Secondary roads (unsurfaced)	0.50	0.86	1.08	1.19	1.19	1.20	1.20	1.17	1.18	1.17	1.16	1.15
Bridges, steel	0.46	0.85	1.01	1.47	1.48	1.48	1.48	1.48	1.48	1.46	1.48	1.48
General property—buildings	0.44	0.68	0.93	1.34	1.35	1.36	1.38	1.40	1.40	1.40	1.41	1.40

Based on combined costs of material and labor furnished by the contractor, and material and labor furnished by the government on US bureau of Reclamation projects in 18 western states including Alaska

Costs Increase

Irrigation and hydro construction costs held steady between July and October, according to the quarterly Composite Cost Index compiled by the Denver Office of the U. S. Bureau of Reclamation. This index is based on the combined cost of labor and materials on projects let in the 18 western states including Alaska.

BuRec's Composite Cost Index held at 1.25 in October, based on average costs during 1949-51 as 1.0. Thus it held onto the gain scored in July, when the index pulled out of a rather sharp slide.

However, both the earthwork and structure phases of lateral construction increased between July and October. The rise was about 1%, which still left earthwork costs 2% under a year ago.

By contrast, October costs were below July for pumping plant structures, power plant accessory electrical equipment, transmission lines, switch-gears

Swing Upward

Bidding for new highway construction projects in the third quarter showed clearly that competition was still rough but that contractors were charging more in several states.

On federal-aid jobs let during July-September, contractor bid prices rose an average of 2.2%, as measured by the U. S. Bureau of Public Roads Composite Mile Index. This index reversed a six-month downtrend and recouped most of its previous drop. Higher bid prices for excavation, concrete pavement, structural concrete and steel offset lower reinforcing steel.

Five out of 10 state highway departments that report their own bid price indexes to ENR show increases in the third quarter: Michigan +5.3%; Nevada +4.1%; South Dakota +26%; Texas +8.1%; and Washington +10.8%.

By contrast, contractors' bid prices for new highway jobs dropped during the third quarter in these states: California −9%; Colorado −0.5%; Idaho −0.9%; New York −7.4%; and Oregon −3.4%. More bidders per project than in the second quarter reflected keener competition in Colorado, New York and Oregon. But California noted little change in the number of bidders, while Idaho reported fewer bidders.

Among the five states where bid prices rose, Michigan and Texas noted a slight increase in number of bidders per job. But there were fewer bids on Nevada and South Dakota jobs, while Washington noted no change.

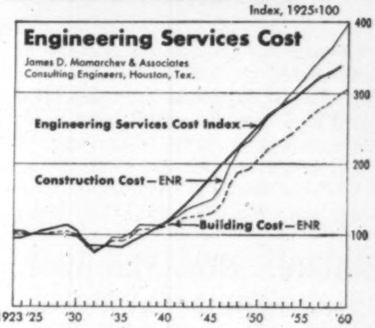
in the West

and substations, and road construction. These reductions offset the increases in lateral costs and kept the Composite Index on an even keel. Meanwhile, costs of canals and dams, key types of work handled by BuRec, held steady.

The latest Composite Index is 0.8% below its year-ago value and 1.6% under January 1960. Moreover, it's 4% below the record high of 1.30 set three years ago.

During the past year, earth dam costs have fallen 4.5%. But concrete dam costs are off only 0.9% and diversion dam costs show no net change. Costs of hydroelectric plant structures were down 3% for the 12 months ending in October. But power plant equipment costs were 1.9% higher than in October '59. The cost of constructing transmission lines has increased by 2.4% during the past year. But BuRec's indexes of building and bridge construction costs were the same in October '60 as in October '59.

Engineering Services Costs



Costs Keep Rising, Setting New Highs

Engineering services costs are moving up and up. A 2.7% rise in 1959 brought the over-all increase during the decade of the Fifties to 43%, according to James D. Mamarchev & Associates, consulting engineers of Houston, Tex.

The rate of increase in engineering services costs was almost constant during the four years 1956-59: The index rose nine or 10 points per year. This was less than the hefty 12-point rise in 1955 and far less than 1951's jump of 16 points. However, the persistency of the uptrend in engineering services costs rates the careful attention of the construction industry. It points up the need for making engineers' time more productive by delegating routine to technicians or by utilizing labor-saving machines.

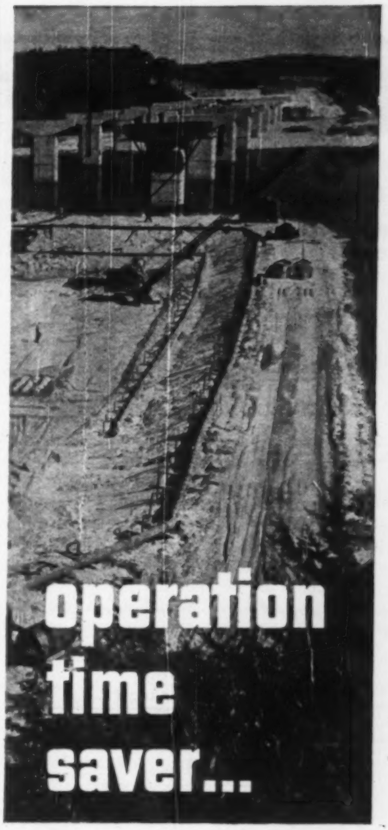
The Engineering Service Cost Index measures the costs of an office and field engineering force of a selected average number of draftsmen, engineers, supervisors and clerical help to plan, design and supervise construction of industrial building of a specific size. Fringe benefits and overhead are included. However, the index included no allowance for engineering service profits.

Cost data for this index are collected and averaged on a national basis.

Engineering Services Cost Index, 1925=100

James D, Mamarchev & Associates, Houston, Texas

Yr.		Yr.		Yr.	
1923	96	1936	90	1948	226
'24	97	'37	97	'49	239
'25	100	'38	103	'50	251
'26	105	'39	110		
'27	108	'40	117	'51	267
'28	111			'52	275
'29	113	'41	130	'53	283
'30	106	'42	143	'54	291
		'43	156	'55	303
'31	87	'44	169		
'32	85	'45	182	'56	313
'33	85			'57	323
'34	84	'46	198	'58	332
'35	83	'47	211	'59	341



GRIFFIN Solves Another Dewatering Problem! To build 11 double piers for the Chicago-to-St. Paul Expressway Bridge over the fast-flowing Wisconsin River, contractor procedure called for constructing three earth cofferdams in the coarse sand, gravel and boulders of the river . . . Typical of construction speed was the progress made in only 10 weeks in the cofferdam shown above: • Construct cofferdam—2 weeks • Install Wellpoint system and dewater to grade—one week • Excavate, drive piles and pour concrete up to river level—7 weeks.

Further proof of time and money saving advantages of Griffin Wellpoint planning, supervision and equipment.

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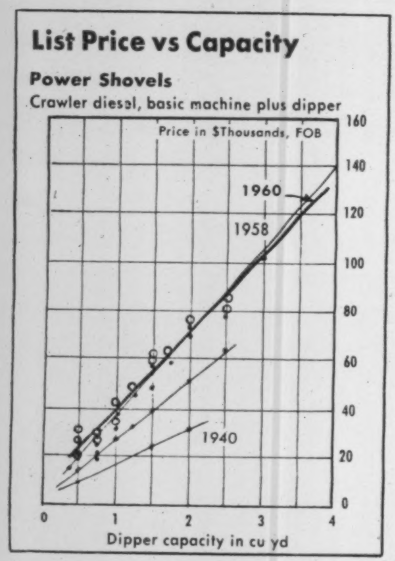
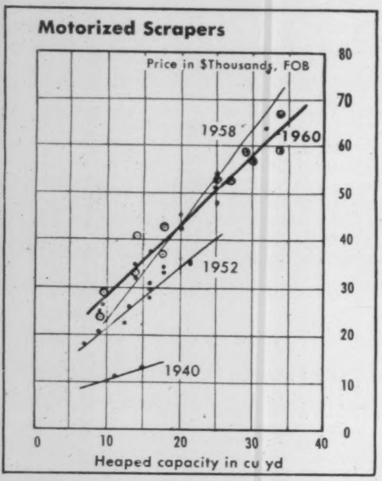
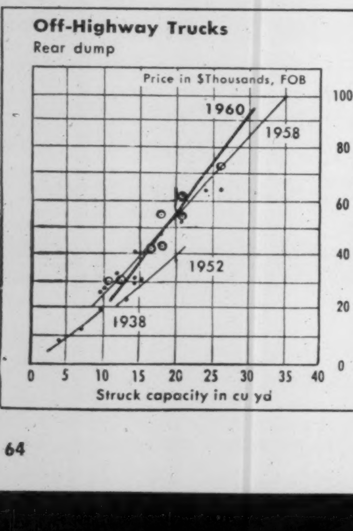
4th Quarterly Cost Roundup **Equipment**

List Prices Steady

List Price vs Capacity







List prices of new construction equipment moved up, on the average, this year. The BLS index of list prices hit a record high on October 15, latest available as we go to press. The index of 177.0, based on average prices during 1947-49 as 100, was 2.6% higher than a year ago. However, there have been scattered reports that manufacturers have shaded prices, in some cases, to entice contractors.

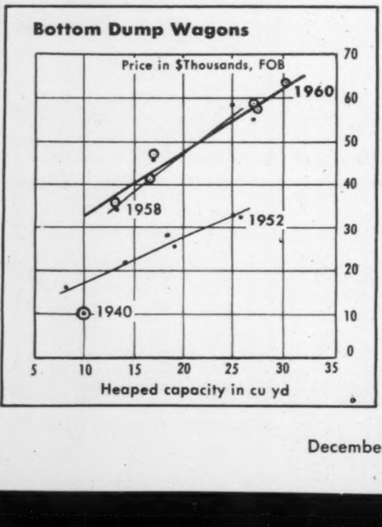
List prices are a good bet to hold steady during the next three months. Several leading equipment manufacturers tell ENR that they have no plans to significantly change prices (up or down

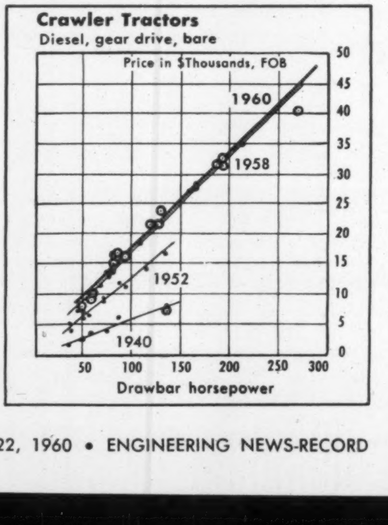
Construction Machinery Price Trend

BLS Primary Market Price Indexes, U. S. Department of Labor, 1947-49=100

	1947	1949	1951	1952	1953	1954	1955	1956	1957	1958	1959	Oct. 1960
All Types of Equipment	**90.0**	**108.3**	**123.6**	**125.4**	**129.3**	**131.6**	**137.1**	**148.6**	**160.0**	**166.3**	**172.1**	**177.0**
Cranes, Draglines, Shovels	**91.0**	**107.5**	**123.5**	**123.9**	**127.8**	**130.9**	**138.1**	**149.1**	**159.9**	**164.4**	**169.3**	**173.6**
Shovel, ½ cy	92.5	105.2	123.1	123.7	126.4	128.6	134.1	143.5	151.1	153.9	161.6	167.9
Shovel, ¾ cy	90.7	107.2	127.5	128.8	133.4	133.3	140.3	153.4	163.1	168.7	173.2	175.4
Shovel, 1-1½ cy	87.8	109.9	127.6	127.2	135.3	136.6	144.7	159.2	171.3	178.3	183.3	189.3
Shovel, 2-2½ cy	92.3	105.1	126.0	124.3	124.7	126.4	126.7	134.4	146.6	155.2	162.2	170.3
Shovel, 3-3½ cy	89.7	108.7	126.7	129.1	130.2	130.8	133.3	146.0	157.3	162.9	167.6	167.8
Shovel, 6 cy	84.5	112.2	129.8	131.7	136.7	138.8	145.4	160.9	175.3	181.3	190.9	197.9
Crane, truck mounted	90.1	108.3	126.4	126.4	131.6	133.7	141.5	154.5	162.3	164.9	167.1	168.2
Crane, tractor mounted	94.2	104.4	110.0	110.0	110.3	111.9	115.6	120.3	129.8	135.1	135.1	135.1
Bucket, clam shell	91.8	109.2	116.7	119.1	122.6	124.5	130.6	137.0	152.7	152.9	157.5	162.9
Bucket, dragline	83.1	107.4	112.6	112.6	119.2	134.9	155.4	166.6	180.8	181.9	171.0	169.3
Scrapers and Graders	**89.0**	**108.8**	**128.0**	**128.9**	**129.0**	**129.4**	**133.1**	**142.8**	**153.1**	**158.3**	**165.4**	**166.6**
Scraper, 4 Wheel, 8-10.5 cy	91.3	107.8	125.4	126.0	126.0	126.7	128.9	139.2	152.6	155.0	155.0	155.0
Scraper, 4 Wheel, 12-15 cy	94.4	104.7	127.1	126.9	124.4	124.4	126.1	134.3	146.2	151.6	156.8	156.8
Scraper, 2 Wheel, 15-19 cy (a)	....	....	....	....	....	....	100.0	109.2	116.6	123.0	123.9	126.2
Grader, heavy duty	88.2	109.2	127.1	128.6	133.0	134.8	137.8	147.6	158.2	162.8	172.4	174.1
Grader, light & medium	85.5	111.4	130.2	131.1	129.7	129.4	135.4	146.1	155.9	161.2	170.3	170.9
Tractors	**87.7**	**110.2**	**125.1**	**128.7**	**136.3**	**140.4**	**145.7**	**160.5**	**173.2**	**181.6**	**187.9**	**194.1**
Wheel-type, Off-highway (a)	....	....	....	....	....	....	100.0	113.0	121.6	128.7	128.3	129.2
Crawler type, under 49dhp	89.5	108.3	121.9	128.0	135.5	142.3	148.3	160.3	170.4	181.0	189.6	195.2
50-74 dhp	89.1	109.3	125.1	128.8	135.6	139.0	145.0	161.0	175.9	184.0	192.2	203.5
75-99 dhp	86.1	110.9	123.6	126.9	137.2	141.7	146.8	164.6	179.6	187.3	196.5	204.3
100-154 dhp	87.3	111.0	124.6	127.9	137.3	140.6	148.2	164.7	177.6	187.2	191.5	199.2
155-200 dhp	86.8	110.9	130.1	136.5	143.9	150.4	154.1	169.9	182.7	192.9	201.3	205.4
Machinery, Tractor Mounted	**87.6**	**109.6**	**122.9**	**129.9**	**132.4**	**133.8**	**136.7**	**145.8**	**157.6**	**162.6**	**168.7**	**176.2**
Dozer, cable control	82.7	113.0	122.6	134.2	140.2	141.4	143.0	148.5	150.1	151.9	154.4	164.8
Dozer, hydraulic control	87.2	109.8	122.9	134.0	136.8	138.9	143.3	155.2	172.8	178.3	186.6	201.9
Cable, power control unit	89.0	107.2	123.1	121.8	122.2	122.1	126.6	133.0	142.4	148.1	151.4	152.9
Loader, shovel type	91.1	108.3	123.4	124.5	125.1	125.7	127.4	136.9	149.6	155.2	161.2	163.9
Specialized Machinery	**91.5**	**105.8**	**119.5**	**119.3**	**122.8**	**123.4**	**126.0**	**136.2**	**145.4**	**150.8**	**155.4**	**158.8**
Ditcher	87.4	108.3	118.6	118.7	121.7	124.2	129.2	142.5	152.2	154.0	155.4	153.8
Roller, tandem	96.7	101.7	130.9	129.2	144.3	146.0	147.5	164.3	182.3	193.6	211.2	226.4
Roller, 3 wheels	95.6	102.9	124.8	126.9	130.8	131.4	132.0	143.3	155.5	161.6	172.6	178.7
Ripper and rooter	90.5	108.5	116.7	115.6	114.4	116.7	118.4	126.0	138.9	143.3	150.5	164.5
Dewater, pump, 10 M gph	92.1	106.7	109.7	107.7	107.8	103.8	101.4	106.1	108.8	111.7	110.3	111.5
Dewater, pump, 90 M gph	88.6	110.2	117.0	117.0	117.9	115.8	119.9	125.7	134.1	144.3	149.7	151.5
Portable Air Compressors	**93.6**	**105.4**	**124.8**	**124.8**	**124.8**	**125.1**	**133.1**	**135.8**	**151.4**	**159.1**	**166.0**	**167.5**
Capacity, under 200 cfm	91.3	107.7	127.9	127.9	127.9	128.4	137.1	141.2	157.0	163.9	171.8	173.2
Capacity, over 200 cfm	95.8	103.1	121.7	121.7	121.7	121.7	129.2	130.3	146.0	154.6	160.8	162.4
Contractors Air Tools	**93.0**	**106.0**	**120.5**	**120.5**	**123.3**	**125.0**	**128.3**	**144.9**	**156.3**	**166.0**	**181.6**	**181.6**
Paving breaker	93.0	106.0	119.7	119.7	123.6	126.0	....	144.4	156.1	166.0	181.6	181.6
Mixers, Pavers, Spreaders	**92.7**	**107.5**	**118.0**	**118.1**	**121.3**	**122.0**	**127.7**	**135.3**	**143.4**	**149.7**	**156.3**	**161.8**
Mixer, portable, 6 cu ft	92.8	105.5	120.3	120.5	123.4	124.4	130.6	137.9	145.2	151.7	157.1	159.6
Mixer, portable, 11 cu ft	93.9	105.1	125.7	124.3	127.0	127.5	137.8	146.8	152.9	160.3	165.1	166.8
Mixer, portable, 16 cu ft	93.7	105.6	120.9	121.8	125.5	127.5	138.2	146.3	155.5	163.9	170.3	172.7
Mixer, truck, 6 cu yd	95.7	104.5	117.3	117.3	111.2	108.4	109.1	114.8	121.9	127.6	131.8	135.1
Mixer, paving, 34 cu ft	93.6	106.5	126.8	127.9	130.5	132.5	143.1	155.9	172.1	185.2	192.5	196.7
Concrete finisher and spreader	93.1	107.0	121.6	122.3	135.8	143.0	150.5	160.4	169.3	177.4	192.4	201.9
Bituminous distributor	90.2	112.9	106.7	106.7	108.3	105.0	103.9	109.6	115.9	122.4	122.3	126.2
Bituminous spreader	91.8	107.8	119.6	119.6	119.6	119.6	135.7	145.7	159.5	160.3	170.2	179.4
Bituminous paver	90.4	107.2	118.2	119.7	129.7	136.9	140.5	145.3	151.4	153.2	162.0	165.6

•a January 1955=100





or Up, But Most Rentals Dip

as much as 1%) during the next three months. A shovel manufacturer, however, plans to up prices "during the first half of 1951 by 3% to 4%." Another major shovel producer says that the outlook for price changes in his line is "uncertain but probably not."

Three large makers of tractors, scrapers and other earthmoving and excavating equipment say that they plan no changes up to April 1. A fourth such company says that "Prices will be increased on a few new models for engineering improvements. However, no general price increase is contemplated."

A leading manufacturer of off-highway trucks says that price changes are "definitely" out between now and April 1—the company is coming out with a new line in June.

Equipment manufacturers are cautious about the outlook for next year's equipment sales. This is apparent from the forecasts of new orders reported to the McGraw-Hill Economics Department (ENR Dec. 8, p. 84). So few companies are likely to change prices until they're well into the 1961 sales year. General, across the board increases are unlikely for 1961. The odds favor selectivity in price changes, as in 1960 when a few machines in some lines were marked up. Look also for more engineering improvements which will net buyers more productive capacity per 1961 equipment dollar.

- **Many rentals lower** – Construction equipment rental rates are generally less this year than last. And a few types of equipment rent for less than they did two years ago, according to the compilation of existing rates, for information purposes only, by the Associated Equipment Distributors.

Over half the large sample of major types of equipment in the table at the right could be rented for less this year. By contrast, in only about one-third of the cases does this year's rate exceed last year, while only about 10% of the rate averages are unchanged in 1960.

The sharpest drops (9% to 19%) are in off-highway dump trucks. Reductions are also general in scraper and compressor rentals.

Tractor shovel rates are lower for some models, higher for others. Centrifugal pumps are steady to higher.

However, crawler tractor rates buck the general downtrend. All but one of the gear drive size ranges shows a higher rental average this year. Unchanged are crawler tractors in the 151-170 drawbar hp range. But rates are jacked up in three size ranges of crawler tractors with torque converters, while rates are down in two ranges, steady in one.

These numerous reductions in 1960 equipment rental rates probably reflect the following developments in the equipment and construction markets: List prices have been far more stable in the last year or two than in the years say 1955, '56 or '57; record contractor investment in new and "young" equipment; and a slowdown in total contracting volume in the first half of this year, resulting from the late '59 highway contracting cutback and the prolonged 1959 steel strike.

Construction Machinery Rental Rates—1961

Associated Equipment Distributors, Chicago, Ill.

These rates are averages of prevailing rental rates made available for information purposes only. All rates are fob lessor's warehouse or shipping point. Lessee pays transportation cost to destination and return. Rates do not include operator, fuel or oil. Lessor bears cost of repairs due to normal wear and tear on non-tractor equipment, the lessee bears all other costs. For tractor and rubber-tired hauling equipment. the lessee bears all costs for maintenance and repair. Rates are based on one shift of 8 hours per day, 40 hours per week, 175 hours per month of a 30 consecutive day period. Overtime is prorated on a per-hour basis. Equipment is delivered to lessee in good operating condition and returned in as good condition less normal wear. Excessive cleaning or repairs may be charged to lessee. Rental rates start when equipment leaves lessor's delivery point. All rents are payable in advance. No insurance, license, sales or use taxes are included in these rates.

Type of equipment	Per Month	Per Week	Per Day	Chg. '59-'60 †%
AIR COMPRESSORS portable				
Gas, 86–105 cfm	188.00	63.25	18.75	−1
Gas, 126–160 cfm	249.00	81.75	25.50	−0
Gas, 186–210 cfm	332.00	109.00	32.75	−1
Gas, 251–315 cfm	462.00	150.00	48.00	+1
Diesel, 186–210 cfm	404.00	133.00	41.50	−1
Diesel, 251–315 cfm	332.00	176.00	56.25	−2
Diesel, 386–500 cfm	730.00	242.00	74.75	+3
Diesel, 501–600 cfm	897.00	299.00	96.25	−2
CRANES, cap at ft radius				
Diesel crawler (no bucket)				
Above 5 , to 6⅝ ton, 10′.	946.00	311.00	104.00	−3
Above 8⅝, to 11⅜ ton, 12′.	1,245.00	414.00	149.00	−4
Above 14½, to 19½ ton, 12′.	1,519.00	528.00	170.00	+1
Above 24½, to 29½ ton, 12′.	2,045.00	678.00	264.00	−5
Above 29½, to 34½ ton, 12′.	2,452.00	829.00	291.00	+3
Above 18 , to 22 ton, 20′.	3,100.00	1,066.00	354.00	−1
Above 10 , to 13 ton, 45′.	4,250.00	1,477.00	474.00	+2
Above 20 , to 24½ ton, 45′.	5,129.00	1,923.00	657.00	−6
GRADERS, diesel rubber tired				
Conventional transmission				
Up to 16,500 lbs	652.00	210.00	66.50	+4
16,501 to 20,500 lbs	803.00	276.00	82.25	−2
22,501 to 26,000 lbs	1,097.00	368.00	116.00	+2
26,001 to 30,000 lbs	1,337.00	464.00	143.00	−1
Torque converter				
16,000 to 21,000 lbs	1,115.00	371.00	118.00	+3
21,001 to 25,000 lbs	1,231.00	432.00	133.00	−7
25,001 to 29,500 lbs	1,429.00	486.00	154.00	−5
29,501 to 45,000 lbs	1,829.00	661.00	196.00	−9
LOADERS (SHOVEL), tractor				
Front end, wheel, mounted front or rear drive, gas				
Up to ⅜ cy	360.00	117.00	38.00	+7
Above ⅜, up to ½ cy	381.00	131.00	40.25	−3
Above ½, up to ⅝ cy	464.00	148.00	46.50	−1
Above ⅝, up to ¾ cy	516.00	175.00	57.50	−4
Above ¾, up to 1 cy	619.00	211.00	67.50	+1
Above 1 , up to 1¼ cy	747.00	256.00	79.75	0
Above 1⅝, up to 2 cy	1,213.00	420.00	136.00	+1
MIXERS, CONCRETE, portable				
Tilt drum, 3 to 3½ cf	65.50	23.00	7.50	−2
Non-tilt, non pwr charge, 3½ cf	85.00	30.25	10.00	−2
Non-tilt, power charge, 6 cf	129.00	44.75	14.25	+3
11 cf	186.00	65.00	23.25	+1
16 cf	264.00	88.50	30.75	−2
Add for batchmeter*	14.75	5.45	2.75	+5
Add for pump*	11.75	4.20	1.80	0
*Rates include measuring tank but not this				
PUMPS**				
Centrifugal, self priming				
Gas, 1½-in, 4M	52.00	18.00	5.95	0
Gas, 2-in, 7M-10M	64.25	22.25	7.55	0
Gas, 3-in, 15M-20M	80.00	27.75	9.45	0
Gas, 4-in, 30M-40M	122.00	41.75	14.25	0
Gas, 6-in, 90M	186.00	63.25	21.50	+2
Diesel, 6-in, 90M	360.00	123.00	42.75	+3
Diesel, 8-in, 125M	568.00	202.00	67.00	−4
**Hose not included				
ROLLERS				
Two-axle tandem, diesel				
5–8 tons*	519.00	162.00	55.00	0
6–9 tons	608.00	190.00	65.00	−2
8–10 tons	608.00	190.00	65.00	−2
ROLLERS continued				
Two-axle, tandem diesel				
8–14 tons	729.00	237.00	80.25	−2
10–14 tons	729.00	237.00	80.25	−2
10–16 tons	1,221.00	367.00	117.00	+3
*Net roller wt—max gross wt incl ballast				
SHOVELS, diesel crawler				
⅜ cy	946.00	314.00	104.00	−2
½ cy	1,184.00	394.00	130.00	−5
¾ cy	1,447.00	487.00	163.00	−3
1 cy	2,088.00	697.00	228.00	+2
1½ cy	2,621.00	879.00	282.00	−6
2 cy	3,923.00	1,323.00	425.00	−1
2½ cy	4,352.00	1,485.00	484.00	−4
3 cy	5,650.00	1,867.00	617.00	−4
3½ cy	6,815.00	2,269.00	744.00	+2
SCRAPERS, w.o. power units				
Heaped capacity				
Above 5, up to 7 cy	377.00	125.00	38.50	−1
Above 7, up to 10 cy	488.00	155.00	47.00	−5
Above 13½, up to 18 cy	702.00	226.00	73.25	−2
Above 17, up to 22 cy	917.00	303.00	96.25	−4
Above 22, up to 29 cy	1,159.00	392.00	126.00	−4
Above 29, up to 37 cy	1,678.00	551.00	166.00	−8
TRACTOR AND SCRAPER				
2-wheel tractor with 2-wheel scraper (heaped capacity)				
From 7 up to 11 cy	1,447.00	511.00	151.00	−6
From 13 up to 16 cy	1,971.00	691.00	213.00	−5
From 16 up to 21 cy	2,393.00	855.00	274.00	−4
From 18 up to 20 cy	2,665.00	900.00	295.00	−4
TRACTORS, diesel crawler				
Gear drive, w.o. attachments				
25– 35 drawbar hp	415.00	141.00	42.00	+3
36– 44 drawbar hp	574.00	184.00	57.50	+1
45– 59 drawbar hp	703.00	228.00	73.25	+1
60– 71 drawbar hp	860.00	282.00	87.00	+7
72– 79 drawbar hp	1,009.00	331.00	105.00	+1
80– 95 drawbar hp	1,132.00	369.00	115.00	+4
96–115 drawbar hp	1,412.00	464.00	146.00	+4
116–131 drawbar hp	1,526.00	501.00	152.00	+6
132–150 drawbar hp	1,685.00	535.00	161.00	+5
151–170 drawbar hp	2,105.00	695.00	224.00	0
201–265 drawbar hp	3,273.00	1,075.00	341.00	+4
Torque Converter, without attachments				
120–144 net engine hp	1,578.00	526.00	167.00	+5
145–164 net engine hp	1,650.00	574.00	188.00	−1
165–185 net engine hp	1,810.00	618.00	198.00	−2
186–214 net engine hp	2,313.00	751.00	221.00	+3
251–330 net engine hp	3,646.00	1,184.00	372.00	+1
over 330 net engine hp	4,029.00	1,437.00	480.00	0
BULLDOZERS				
For crawler tractors of				
36– 44 drawbar hp	167.00	57.00	18.50	+2
72– 79 drawbar hp	237.00	78.50	27.25	−5
96–115 drawbar hp	286.00	92.25	32.00	−4
132–150 drawbar hp	363.00	120.00	40.00	−3
201–265 drawbar hp	483.00	165.00	54.75	−1
TRUCKS, off-highway, rear dump				
Single drive axle, body capacity				
Above 7½, up to 10 tons	1,692.00	......	......	−19
Above 10, up to 15 tons	1,883.00	......	......	−9
Above 15, up to 20 tons	2,058.00	......	......	−13
Above 20, up to 23 tons	2,632.00	......	......	−6
Above 23, up to 25 tons	3,745.00	......	......	−3

†Percentage change in average monthly rates

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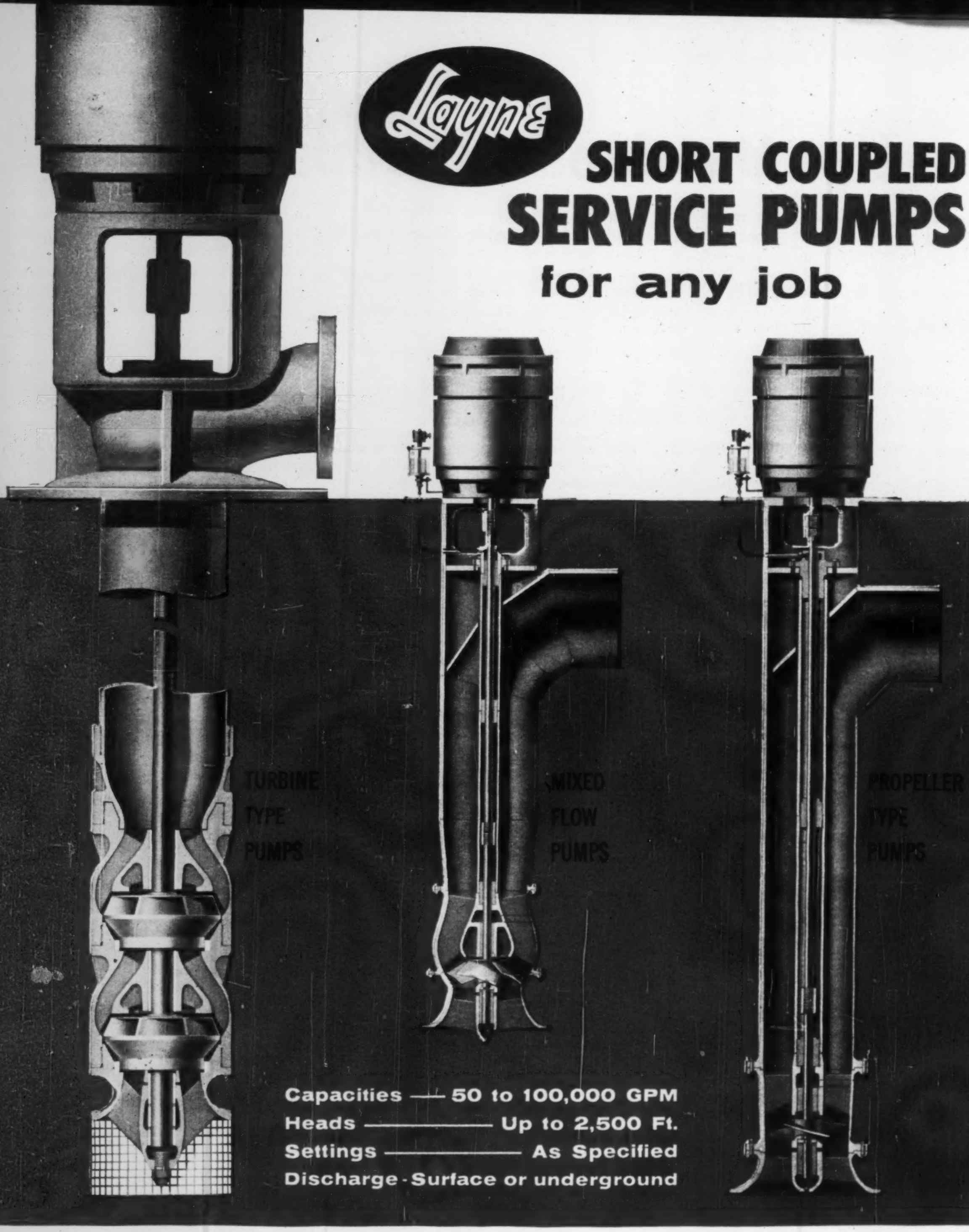

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CIRCLE 66 ON READER SERVICE CARD

4th Quarterly Cost Roundup

LABOR RATES: Slightly Bigger Raises in '61

Costs will again ride upward on the construction wage escalator in 1961. Unions in 17 of the 20 U. S. cities covered by ENR's cost indexes will receive automatic wage hikes provided by existing long-term contracts. In addition, other unions will negotiate wage hikes in new labor contracts during 1961.

The combined average of deferred and newly negotiated construction wage hikes in 1961 will be close to 12.8¢ an hour for laborers and 15.8¢ for the three-skill average of bricklayers', carpenters' and structural ironworkers' rates, ENR forecasts. These increases would push the 20-cities average rate to $2.875 an hour for common labor and $4.257 for the three key skilled trades by Dec. 1, 1961.

While these increases are large, they are only fractionally above the 1960 average gain. And they are somewhat less than 1959's average of 14.1¢ an hour for common, 17.9¢ for skilled labor. Thus next year will also benefit from construction contractors' limited success at 1960 bargaining sessions in slowing down the pace of construction wage inflation.

Next year will see a few very large increases. In New York, for example, structural ironworkers will get wage-plus-fringe increases totaling a whopping 50.4¢ per hour. Bricklayers' total wage-plus-fringe boosts will be 42¢ per hour. Boosts of 32.5¢ per hour are scheduled for structural ironworkers in Los Angeles and San Francisco.

A number of deferred and newly negotiated wage boosts will also go to construction equipment operators. ENR's 20-cities average of operators' rates will probably rise 15.4¢ to $3.982 per hour by December 1961 (tractor, power shovels and compressor operators average).

These Wage Hikes Are Automatic in 1961

Deferred wage increases shown for key trades in 20 cities, including fringe benefit increases. Wage hikes will be negotiated for other unions whose contracts expire (C.E.) on dates shown.

	Common Labor		Skilled Labor			Equipment Operators		
	Building	Heavy Construction	Bricklayers	Carpenters	Structural Ironworkers	Tractor	Power Shovel	Air Compressor
Atlanta	Exp. 6/30/61				Exp. 8/30/61	Exp. 6/30/61		
Baltimore	4/1: **2.5¢**	4/1: **2.5¢**	9/31: **5.0¢**	6/11: **12.5¢**	6/1: **2.5¢**	4/1: **10.0¢**	4/1: **15.0¢**	4/1: **10.0¢**
Birmingham	Exp. 8/31/61		Exp. 9/1/61	3/1: **7.0¢***	Exp. 9/1/61	Exp. 9/1/61		
Boston	4/1: **10.0¢#**	Exp. 4/1/62	5/1: **15.0¢**	Exp. 4/30/61	7/1: **10.0¢**	Exp. 2/28/61		
Chicago	Exp. 5/31/61		6/1: **17.5¢**	6/1: **17.0¢**	6/1: **20.0¢**	6/1: **15.0¢**	6/1: **15.0¢**	1/1: **15.0¢**
Cincinnati	Exp. 6/1/61							
Cleveland	Exp. 5/1/61							
Dallas	Exp. 7/1/61		7/1: **5.0¢**	1/1: **5.0¢**	Exp. 4/1/61	†	1/26: **5.0¢** 7/27: **5.0¢**	Exp. 7/1/61
Denver	Exp. 3/1/61		Exp. 4/1/61	1/1: **5.0¢**	4/1: **10.0¢** 10/11: **10.0¢**	Exp. 3/1/61		
Detroit	5/1: **10.3¢**	5/1: **10.3¢**		5/1: **12.7¢**	5/1: **15.0¢**	5/1: **11.4¢**	5/1: **11.4¢**	5/1: **11.4¢**
Kansas City	4/1: **12.5¢**	4/1: **12.5¢**	4/1: **12.5¢**	4/1: **12.5¢**	4/1: **12.5¢**	4/1: **15.0¢**	4/1: **15.0¢**	4/1: **15.0¢**
Los Angeles	4/30: **18.0¢**	4/30: **18.0¢**	5/1: **15.0¢**	Exp. 4/30/61	8/16: **32.5¢**	6/1: **25.0¢**	6/1: **25.0¢**	6/1: **25.0¢**
Minneapolis	1/1: **15.0¢**	5/1: **15.0¢**	5/1: **15.0¢**	5/1: **18.0¢**	5/1: **15.0¢**	1/1: **13.0¢**	1/1: **15.0¢**	5/1: **15.0¢**
New Orleans	11/1: **2.5¢**	11/1: **2.5¢**	11/1: **2.5¢**	11/1: **5.0¢**	11/1: **5.0¢**	5/1: **10.0¢**	5/1: **10.0¢**	5/1: **5.0¢**
New York	1/1: **10.8¢** 7/1: **10.8¢**	1/1: **10.8¢** 7/1: **10.8¢**	1/1: **21.0¢** 6/1: **21.0¢**	1/1: **10.8¢** 7/1: **10.8¢**	1/1: **39.2¢** 7/1: **11.2¢**	7/1: **10.8¢**	7/1: **10.8¢**	7/1: **10.8¢**
Philadelphia	Exp. 4/30/61		5/1: **15.0¢**	Exp. 4/30/61	7/1: **15.0¢**	Exp. 4/30/61		
Pittsburgh	Exp. 5/31/61	Exp. 12/31/61	Exp. 5/31/61		Exp. 6/30/61	Exp. 12/31/61		
St. Louis	5/1: **10.0¢** 11/1: **10.0¢**	5/1: **10.0¢** 11/1: **10.0¢**	Exp. 1/1/61	5/1: **10.0¢** 11/1: **10.0¢**	5/1: **10.0¢** 11/1: **10.0**	5/1: **17.5¢**	5/1: **17.5¢**	5/1: **17.5¢**
San Francisco	5/1: **18.0¢**	5/1: **18.0¢**	Exp. 1/1/62	6/1: **22.5¢**	8/16: **32.5¢**	7/1: **22.0¢**	7/1: **23.0¢**	7/1: **19.0¢**
Seattle	1/1: **15.0¢**	1/1: **15.0¢**	Exp. 6/30/61	1/1: **16.0¢**	4/1: **16.0¢**	Exp. 5/31/61		

Exp. 5/31/61 * Exp. 9/1/61 † No contract in force

MONEY: Cheaper Borrowing Costs Ahead

Borrowing costs shrank during the second half of this year. It became cheaper to borrow long-term funds to finance new construction. It also cost less for construction loans, many contractors with top credit standings found out in the last six months.

The outlook is for long-term interest rates to remain favorable during 1961. Rates may decline further if corporate borrowing drops off in line with the prospective slide in industrial building forecast by ENR (Sep. 8, 1960, p. 21).

Lower long-term borrowing costs, or continuation of current rates, would help encourage prospective construction buyers to go ahead with their projects. This effect should show up clearly in state and local public works contracts, which are sensitive to shifts in borrowing costs.

Contractors will benefit from some easing in bank loan terms. The better credit risks in the industry will probably find construction loans more readily available and net borrowing costs the lowest in nearly two years.

The incoming new Administration in Washington is committed to "cheaper" money—lower interest rates than in the past eight years. Thus new federal policies beginning next year conceivably could eliminate the "restraining" power of borrowing costs on new construction contracts. But a different damper would then likely bear down on the construction market: Faster cost inflation.

Borrowing Cost Trends

Long-Term Bonds*

(Per cent yield to maturity)

Year	US Treas. %	Municipal %	Industrial %	Public Utility %	Railroad %
1929	3.60	4.27	5.04	4.96	4.67
1931	3.34	4.01	4.79	4.57	4.42
1939	2.41	2.76	2.64	2.83	3.39
1945	2.34	1.67	2.50	2.59	2.75
1946	2.19	1.64	2.44	2.50	2.59
1949	2.28	2.21	2.53	2.69	2.71
1951	2.60	2.00	2.72	2.90	2.89
1957	3.47	3.60	3.80	3.99	3.94
1958	3.23	3.56	3.65	3.86	3.89
1959 Aver	**4.10**	**3.95**	**4.25**	**4.49**	**4.41**
Dec	4.42	4.05	4.45	4.65	4.66
1960: Mar	4.11	3.87	4.34	4.51	4.55
Apr	4.17	3.84	4.28	4.50	4.55
May	4.15	3.85	4.29	4.54	4.54
Jun	3.93	3.78	4.30	4.55	4.47
Jul	3.78	3.72	4.25	4.48	4.44
Aug	3.71	3.53	4.10	4.37	4.34
Sep	3.72	3.53	4.09	4.35	4.29
Oct	3.85	3.50	4.15	4.43	4.32
Nov	3.88	3.46	4.18	4.43	4.35

Short-Term Business Loans#

Year	New York City %	7 Other Northern & Eastern Cities %	11 Southern & Western Cities %
1929	5.76	5.82	5.93
1931	3.82	4.26	4.90
1939	2.15	3.05	3.62
1945	2.20	2.55	2.80
1946	1.84	2.51	2.97
1949	2.35	2.86	3.17
1957	4.23	4.39	4.65
1958: Mar	4.29	4.49	4.77
Jun	3.88	4.17	4.58
Sep	4.00	4.21	4.54
Dec	4.29	4.50	4.79
1959: Mar	4.29	4.49	4.84
Jun	4.71	4.90	5.07
Sep	5.15	5.27	5.44
Dec	5.19	5.39	5.56
1960: Mar	5.18	5.34	5.57
Jun	5.19	5.34	5.58
Sep	4.74	4.96	5.32

* Standard & Poor's data: Taxable Treasury bonds (Federal Reserve Bd. series on partially tax exempt bonds shown for years 1929-39 had 1945 value of 1.66%); high grade municipal bonds; A1+ grade industrial, utility and railroad bonds.

Federal Reserve Board data for June. New Series 1949 to date; two former series cover up to 1938 and 1939-48 and are not strictly comparable.

4th Quarterly Cost Roundup

Building Price and Cost Indexes

Contractors' Prices Mark Time

Competition for new work, coupled with more stable materials prices and readily available supplies of materials, labor and equipment are holding building contractors' selling prices to little, if any, increase this year.

Keen competition reflects the fact that while new building construction business rose for the third consecutive year, annual volume is not yet back to the 1956 peak. In fact, even next year's anticipated increase in building contract awards isn't likely to pull 1961 volume up to the old peak, according to ENR's actual and forecast contract figures.

Meanwhile, contractor selling price indexes are remarkably steady. Turner Construction Co.'s industrial building price index in October was unchanged for the fifth consecutive quarter. This index has moved up only 1.6% in the past two years. Other industrial building price indexes are also steadying. The Austin Co.'s index in September was the same as a year earlier. The Aberthaw Construction Co.'s index rose 1.8% in the second half of this year vs. a 2.7% rise in the second half of last year—and its 12-month rise of only 2.3% this year compares with a 4.7% jump in 1959.

The George A. Fuller Co. general building price index edged up in October. But while it thus increased for the fourth consecutive quarter, this index is much steadier than in recent years. The October '60 value is 2.4% above a year ago. In the preceding 12-month period, the Fuller index rose 3.4%.

Two "weighted" price indexes have dropped in the past six months or so. The E. H. Boeckh index for commercial and factory buildings cut a sawtooth pattern of decline between July and November 1960. The November index was back down to the March '60 point, and it was a scant 0.6% higher than November '59. The Smith Hinchman & Grylls industrial building price index declined 1.6% between May and July, then leveled off. It held steady in August, moved back slightly in September and held again through November. The latest value of this index is a shade lower than a year ago.

Of the 20 major U. S. construction centers covered by the ENR cost indexes, only Chicago has a lower Construction Cost Index this year. And only in New Orleans is the ENR Building Cost Index lower than in December 1959.

Baltimore, New York, St. Louis, San Francisco and Kansas City had notable success in holding the cost line in 1960. Increases in one or the other ENR index for these cities were under 1%.

Wage increases, both deferred and newly negotiated, accounted for moderate increases in other cities.

ENR indexes for Dallas showed the largest percent increases of the 20 cities. Building and Construction Cost Indexes rose 6% to 7%, reflecting higher prices for southern pine lumber and higher wage rates for construction workers.

ENR Cost Indexes for 22 Cities, 1913 = 100

Construction Cost Index

City	Dec. '49	Dec. '57	Dec. '58	1959 Sep	1959 Dec	1960 Mar	1960 Jun	1960 Sep	1960 Dec
Atlanta	345	548	584	624	623	639	633	650	652
Baltimore	424	670	709	745	745	740	755	755	753
Birmingham	377	593	619	652	652	653	654	674	674
Boston	532	765	807	836	823	833	836	833	849
Chicago	542	836	859	923	918	919	919	917	911
Cincinnati	496	748	777	818	814	815	845	844	839
Cleveland	530	859	880	925	921	920	944	943	944
Dallas	397	547	573	604	604	604	629	639	640
Denver	470	710	731	742	747	758	753	756	756
Detroit	515	831	892	945	942	946	966	964	964
Kansas City	511	742	768	803	798	798	823	818	813
Los Angeles	494	778	824	877	868	870	870	908	901
Minneapolis	512	788	824	860	859	860	890	890	885
New Orleans	379	591	617	635	641	644	649	640	649
New York	529	888	940	1016	1008	1011	1008	1038	1036
Philadelphia	515	775	790	795	791	793	830	830	830
Pittsburgh	492	788	827	858	849	870	885	885	885
St. Louis	522	796	844	880	874	880	900	895	901
San Francisco	483	761	812	858	850	851	885	883	876
Seattle	530	747	799	839	831	859	857	855	853
Montreal	394	591	604	620	630	630	650	650	649
Toronto	...	609	638	666	657	673	697	692	690
U.S. Average	480	738	774	**812**	**807**	**813**	**827**	**831**	**831**

Building Cost Index

City	Dec '49	Dec '57	Dec '58	1959 Sep	1959 Dec	1960 Mar	1960 Jun	1960 Sep	1960 Dec
Atlanta	313	456	472	497	499	503	498	501	504
Baltimore	351	520	542	553	558	553	562	561	559
Bigmingham	319	476	493	513	515	517	518	526	526
Boston	372	523	542	566	554	565	566	567	572
Chicago	353	528	562	586	581	582	594	592	586
Cincinnati	362	504	515	540	539	540	551	549	545
Cleveland	349	524	533	558	554	553	562	561	561
Dallas	318	451	469	490	490	491	519	524	525
Denver	359	522	532	540	545	542	545	551	552
Detroit	351	545	574	599	595	599	608	605	605
Kansas City	357	516	533	558	553	553	562	559	553
Los Angeles	340	513	530	560	554	556	566	569	561
Minneapolis	363	537	553	569	569	570	573	581	576
New Orleans	325	481	494	508	511	514	517	507	508
New York	402	591	609	652	643	646	647	648	645
Philadelphia	392	561	569	582	578	580	583	589	598
Pittsburgh	377	568	595	610	601	609	618	621	626
St. Louis	377	546	563	579	573	579	583	579	576
San Francisco	345	506	533	551	549	553	553	560	553
Seattle	341	458	484	508	500	504	504	506	504
Montreal	314	453	449	457	459	459	466	466	464
Toronto	...	471	479	497	488	498	497	492	492
U.S. Average	353	516	535	**556**	**553**	**555**	**561**	**563**	**561**

Building Cost Trends by Type—1913=100

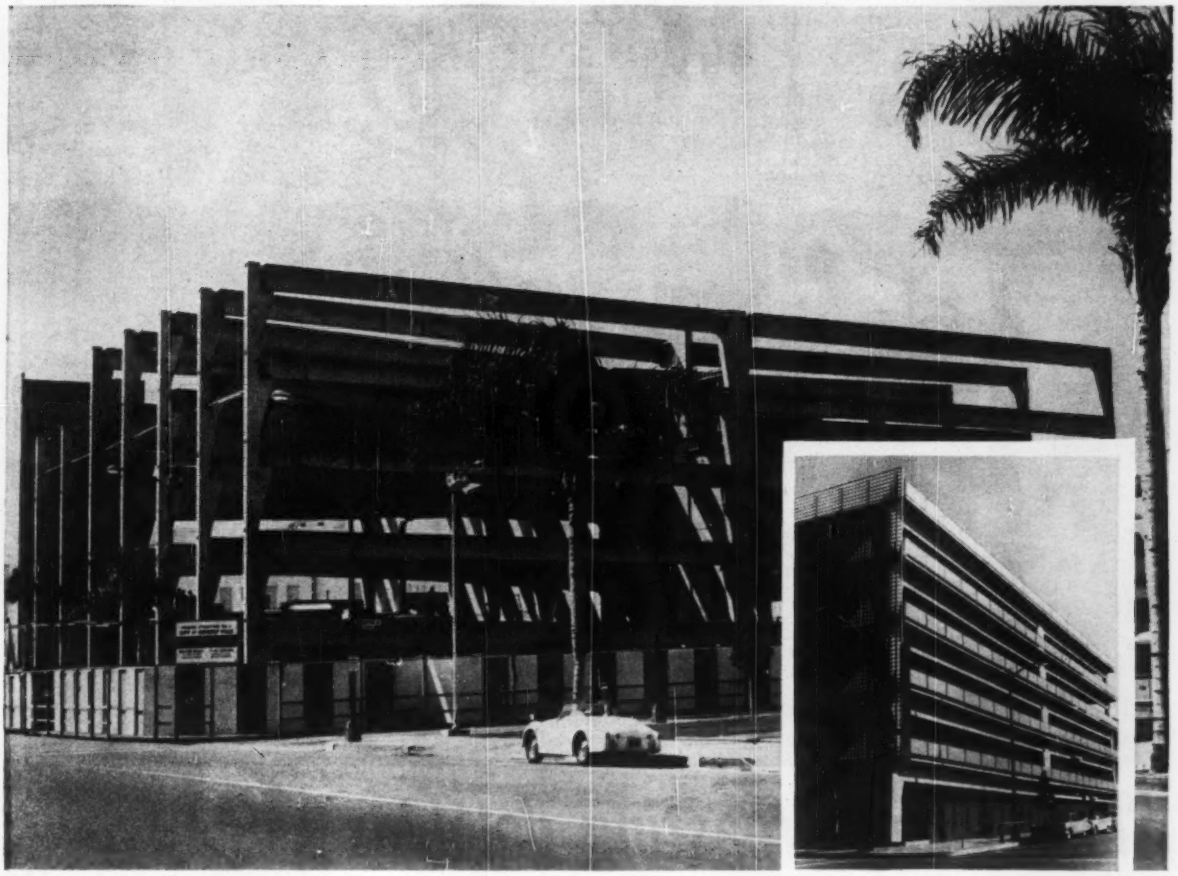
	Weighted Cost Indexes						Contractor Price Indexes						Com-posite Cost
	General Construction		Industrial		Comm'l & Factory	General Building		Industrial				Gen.	
Yr. & Month	ENR Constr. Cost	Assoc. Gen. Contr.	American Appraisal Co.	Marshall & Stevens	E. H. Boeckh *cd*	ENR Bldg. Cost	Smith Hinchman & Grylls *ag*	Aber-thaw *be*	Austin *g*	Fruin. Colnon	Turner	Fuller *h*	U. S. Dept. Comm. *d*
1913	100	100	100	100	100	100	...	...	100	100	100	100	...
1926	208	197	217	185	181	185	185	197	185	218	195	202	179
1932	157	171	155	130	144	141	128	168	117	178	136	157	140
1939	236	188	200	183	191	197	199	190	152	208	182	195	180
1945	308	231	271	248	252	239	285	236	234	247	258	241	235
1946	346	257	322	288	275	262	319	279	273	285	318	290	269
1949	477	342	490	365	369	352	395	312	307	382	413	382	363
1955	660	439	608	479	465	469	522	398	366	483	498	462	440
1956	692	462	635	503	489	491	544	427	400	503	544	482	465
1957	724	483	663	515	507	509	568	453	420	512	576	504	482
1958	759	499	682	528	517	525	565	453	427	530	576	526	486
1959	**797**	**517**	**704**	**544**	**535**	**548**	**575**	**473**	**429**	**551**	**587**	**545**	**496**
1960 Av	...	...	...	...	...	...	...	...	...	...	...	...	...
Jan	812	527	714	...	542	554	590	...	...	556	589	556	500
Feb	813	527	715	...	545	555	590	...	...	556	...	...	504
Mar	813	529	716	552	544	555	590	...	431	568	...	...	504
Apr	813	529	717	...	544	555	590	...	...	568	589	557	504
May	819	530	719	...	546	560	588	...	...	568	...	...	504
Jun	827	535	720	554	546	561	583	481	431	568	...	...	507
Jul	829	537	722	...	545	563	581	...	...	572	589	561	...
Aug	830	538	723	...	544	562	581	...	...	572	...	...	504
Sep	831	538	727	559	545	563	583	...	431	...	...	...	...
Oct	830	538	728	...	544	561	583	...	...	...	589	562	507*p*
Nov	830	538	730	...	544	561	583	...	...	...	...	...	...
Dec	831	...	...	...	...	...	...	490*p*	...	...	...	...	...

•a Incl adjustment for estimated changes in productivity •b 1914=100 •c Incl contractor overhead, profit and adjustment for estimated changes in productivity •d 1915=100 •e Semi-annual since Sep. '56 •f Computed on 1926–29 base •g Computed on 1926 base •h Computed on 1939 base •p Preliminary

Monthly Index History

Historical record of ENR Cost Indexes, graphs and tables for all years 1913-60 is in the supplement to ENGINEERING NEWS-RECORD, *Mar. 24, 1960. Reprints are available at $0.50 each from Business News Department, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.*

Owner: City of Beverly Hills, Cal.; **Architect:** Welton Becket & Associates, Los Angeles, Cal.; **Consulting Engineers:** T. Y. Lin & Associates, Van Nuys, Cal.; **General Contractors:** C. L. Peck, Los Angeles, Cal.; Ellis E. White Co., Los Angeles, Cal.; **Precast Columns & T's:** Wailes Precast Concrete Corp., Sun Valley, Cal.



PLASTIMENT increases workability of lightweight concrete

The five-story Beverly Hills Garage illustrated above, providing parking space for 400 cars, is a unique precast, prestressed structure. Long spans of 75 feet eliminated columns in parking areas and use of lightweight aggregate minimized both horizontal and vertical loading.

Use of Plastiment Retarding Densifier increased the workability of the Ridgelite lightweight concrete thereby assuring a smooth, clean appearance to the exposed concrete members. Using high early cement, strengths averaged over 3,500 psi in 16 hours in the precast elements. Slab concrete placed at the site reached 3,500 psi in 2 days. 28-day strengths averaged 6,500 psi.

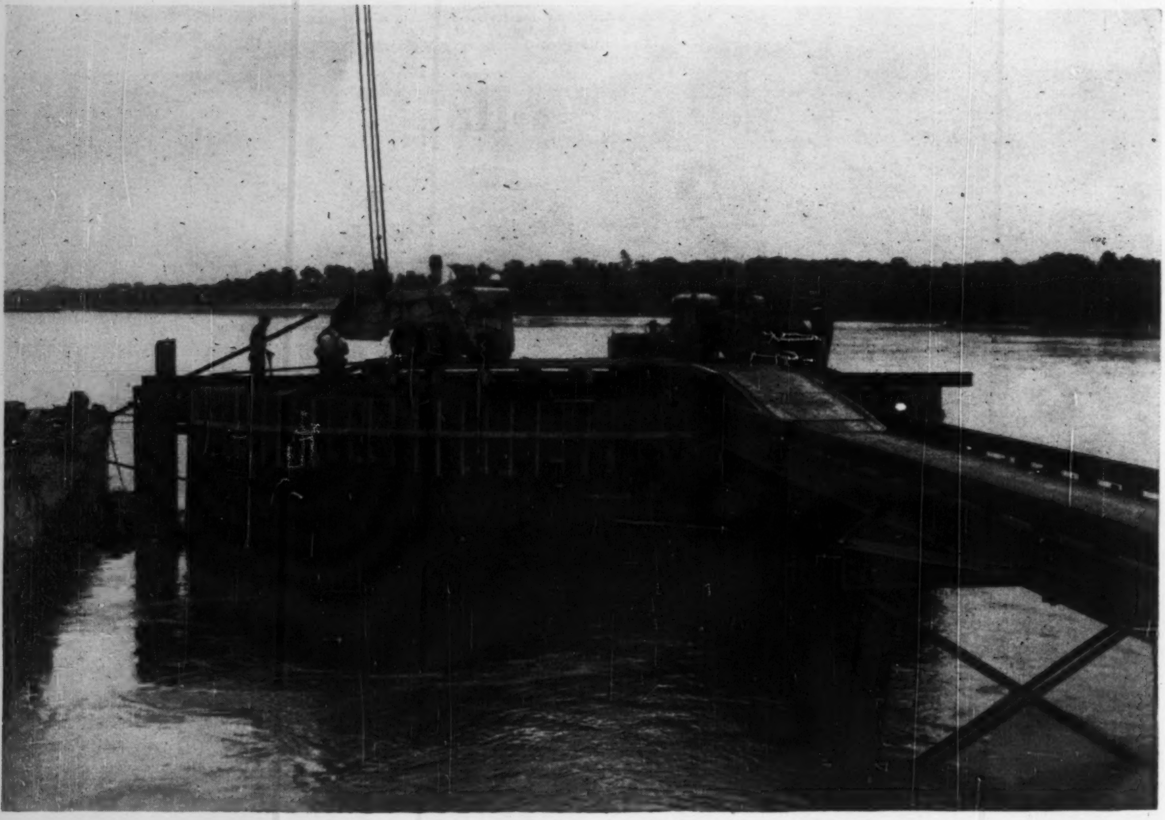
Mix contained 7-1/2 bags of cement per cubic yard and 2 fluid ounces of Plastiment per sack of cement.

Plastiment features are detailed in Bulletin PCD-59. Ask for your copy. District offices and dealers in principal cities; affiliate manufacturing companies around the world. In Canada, Sika Chemical of Canada, Ltd.; in Latin America, Sika Panama, S. A.

Sika

SIKA CHEMICAL CORPORATION

Passaic, N. J.



Sheet-piling breasting dolphins built around prefabricated falsework

Maneuvering of 27,000-ton oil tankers in the Piscataqua River near Portsmouth, N.H., is greatly facilitated by two new breasting dolphins, constructed of steel sheet-piling.

Falsework for the 47.9-ft dolphins was constructed on shore, then floated out to position in the river. The falsework, held firm by H-pile sections, permitted accurate pile-driving and closure of the Bethlehem sheet piling, despite a five-knot current.

After the sheet piling was in place, the cells were partially filled with gravel, and the falsework removed. Then more gravel was added (for a total of 3500 cu yds each) and the dolphins topped with a concrete cap. Each dolphin required 120 Bethlehem SP6A sheet-pile sections, 55 to 57 ft long. Seaboard Construction Company is the contractor for Atlantic Terminal Sales Corporation.

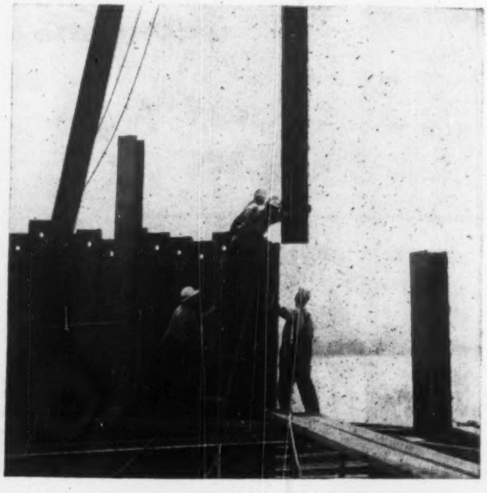
for Strength
. . . Economy
. . . Versatility

Steel

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



4th Quarterly Cost Roundup

Where the Building Dollar Goes

Unit and Ratio Costs Supplied through the Courtesy of Alexander Schnip & Sons, Norwich, Conn.; Taylor Construction Co., Miami, Fla.; M. J. Brock & Sons, Inc., Los Angeles, Calif.

TYPE OF: Building	Chapel*	Warehouse	Apartment^a	Motel	Factory	Apartment
Construction: frame	concrete foundation, laminated wood arches	concrete floor slab	concrete	concrete	steel	steel & concrete
outside walls	masonry	concrete tilt-up walls	grille block, curtain wall, tile	block wood, glass	precast concrete	gunite
Date construction started	Oct. 1960	Oct. 1959	Spring 1960	Fall 1958	Oct. 1960	Jan. 1961
Location	Norwich, Conn.	Taftville. Conn.	Miami Beach, Fla.	Baton Rouge, La.	Fullerton, Calif.	Los Angeles, Calif.
SIZE OF BLDG:						
Height, stories	1, 28 ft high	1, 19 ft high	14, basement	2	1	22
Floor area, sq ft	8,300 sf	141,890 sf	316,700 sf	57,065 sf	98,000 sf	450,000 sf
Volume, cu ft	195,120 cf	....	3,399,070 cf	545,893 cf	1,960,000 cf	70,480,000 cf
RANGE of Cost of this type Bldg:			Min. Aver. Max.	Min. Aver. Max.		
$ per sq ft	$27.27^b	$4.32	$12.50 14.45 15.70	$12.60 14.70 16.80	$9.37	$11.90
$ per cu ft	1.16^b	.....	1.35 1.46 1.55	1.30 1.50 1.70	0.47	0.08
% Air Conditioned	0	0	100%	100%	60%	0
Engineering News-Record Building Cost Index (1913=100) 20-cities average	561	555	555	536	561	

PRINCIPAL ITEMS OF COST	$ and % of Total Cost											
	$	%	$	%	$	%	$	%	$	%	$	%
Excavation & site improvements	6,000	2.50	52,700	8.60	53,300	1.10	47,489	5.30	80,100	8.70	67,700	1.30
Foundations	28,500^c	12.00	140,600^h	23.00	161,476^k	3.30	7,395	0.80	87,100	9.50	196,300	3.70
Caissons or pilings									1,000	0.11	77,600	1.45
Reinforcing	4,800	2.00	13,500	2.20								
Structural frame	3,500	1.50	122,500	20.00	1,078,938	21.70	105,660	11.90	187,000	20.40	1,788,500	33.40
Laminated arches & wood plank deck	10,000	4.21										
Cement finish work	incl in foundations		incl in foundations		44,638	0.90	14,281	1.60	11,800	1.28	50,000	0.93
Exterior masonry	21,700	9.10			524,035	10.53	34,925	3.90	11,900	1.30	8,000	0.15
Wellpoints			5,000	0.81								
Limestone	900	0.40										
Flagstone	600	0.25										
Metal wall panels					132,254^l	2.70						
Interior partitions	4,300	1.80	1,000	0.16	in plaster & masonry		incl in carpentry		6,000	0.65		
Toilet partitions	incl in general conditions											
Carpentry & millwork	28,800	12.10	10,500	1.70	355,125	7.10	137,549	15.50	19,300	2.10	124,600	2.32
Sash & glazing	16,400	6.90	600	0.09	307,393	6.20	45,709	5.10	6,600	0.72	153,300	2.90
Doors	incl in carpentry		incl in carpentry		incl in carpentry		697^q	0.07	1,100	0.11	71,500	1.30
Metal roll doors			16,000	2.60								
Roofing	4,500	1.90	97,300^i	15.90	7,020	0.14	16,822^r	1.90	29,200	3.20	30,000	0.56
Insulation	in roofing		in roofing		in roofing		2,225	0.20			3,000	0.05
Waterproofing & dampproofing	3,200	1.40					2,747	0.31				
Metal lath, furring & plastering	2,000	0.80			255,950	5.10	5,845	0.66	11,800	1.30	885,500	16.54
Hollow metal work	1,600	0.70	700	0.11	42,830	0.86	265	0.03	3,900	0.42	22,200	0.42
Misc. Iron & ornamental metal	incl in structural frame		1,450	0.23	26,260	0.53	23,661	2.60	4,000	0.43	150,600	2.81
Tile, terrazzo & marble	2,200^d	0.90	100^d	0.01	171,130	3.40	15,305	1.70	3,700	0.40	133,500	2.50
Floor covering	2,250	0.94	144^j	0.02	38,400	0.77	10,082	1.00	14,000	1.50	50,400	0.94
Painting	4,500	1.90	19,300	3.14	116,480	2.30	28,421	4.30	12,200	1.30	101,300	1.90
Grouting			1,000	0.16								
Finish hardware	1,100	0.46	500	0.08	36,470^n	0.70	8,762	0.90	2,400	0.26	33,400	0.62
Acoustical ceilings					36,843	0.74	2,949	0.33	41,300	4.50		
Electrical work & light fixtures	17,000	7.20	34,300	5.60	459,680	9.20	105,395	11.90	131,300	14.30	285,800	5.30
Heating, ventilating, air conditioning	29,200^e	12.30	by owner		431,600^o	8.70	in plumbing		98,700	10.74		
Plumbing	7,800	3.30	9,100	1.50	347,360	7.00	249,996^s	28.00	53,600	5.80	687,600	12.80
Incinerator					7,800	0.15						
Sewage Plant							8,627	0.90				
Power Plant									23,400	2.60		
Special equipment	2,750^f	1.20							29,100^t	3.20	229,900^t	4.30
Sprinkler system			30,000	4.90					47,900	5.20	23,900	0.44
Elevators					134,785	2.70					165,800	3.10
Lockers & benches			1,500	0.25								
Skydomes			3,300	0.54								
Intercommunication systems & TV					in electrical		in electrical					
Production equipment					141,367^p	2.84					14,600	0.27
Swimming Pool					27,560	0.60	10,296	1.10				
Sea wall					36,600	0.73						
Steeltex	500	0.21										
General conditions, profit, overhead	33,300^g	14.03	51,798	8.40								
Total Cost	$237,400	100%	$612,892	100%	$4,975,294	100%	$885,103	100%	$918,400	100%	$5,355,000	100%

* nave seats 600 people a with basement parking b not incl underground tunnel c incl floor & 220 ft of underground tunnel d excluding terrazzo e heating & ventilating only f religious items g incl folding doors, caulking, hardware, carpeting, stone sills, fire hose cabinet h incl sidewalls i and poured gyp roof deck j base only k on piling l exterior m sliding glass doors & curtain walls incl n incl medicine cabs o excluding heating p kitchen q folding r & sheet metal s incl pool & sewage plant piping t appliances incl

This report is the eighteenth in Engineering News-Record's Building Dollar series. Earlier reports were published in ENR Oct., 1953; Sept. 29, 1955; July 5, 1956; Aug. 2, 1956; Dec. 6, 1956; Oct. 17, 1957; Mar. 20, 1958; Dec. 25, 1958; Mar. 19, 1959; June 18, 1959; Dec. 17, 1959; Mar. 24, 1960; June 23, 1960; Sept. 22, 1960.

100 TONS at 15′ RADIUS

makes the BEST *crane even* BETTER!

Now, with the new Manitowoc Model 3900, you get a *full 100-TON* lifting capacity at a practical *FIFTEEN FOOT RADIUS* with plenty of reserve power and stability. This means the 3900, already recognized in the field as the TOP lifting crane in its class, will lift 33% *more* than it did before. Check these new advances and see why a Model 3900 crane can make *more money* for you.

INCREASED LOAD CAPACITY AT GREATER RADIUS — With a 60-ft. boom, the 100-ton maximum load can be lifted at a radius of 15 feet.

NEW "INVERTED ANGLE" BOOM IS LIGHTER, STRONGER — Made of a special new alloy, the new Model 3900 crane boom features tubular lacings welded to *inner faces* of the main chords for greater strength and longer life. Boom weight is reduced, yet strength and rigidity are increased. You can use longer booms — up to 170′ — with higher capacities. Long reach tubular booms are also available.

SIMPLE BOOM INSERT CONNECTIONS with a single bolt at each joint permit fast in-the-field addition or removal of extra boom sections.

NEW 3-PIECE SELF-REMOVABLE COUNTERWEIGHT provides proper balance and ample stability. Carbody and rotating bed are matched to the demands of increased counterweighting and bigger work loads. As before, the counterweight is removed by the machine itself without the use of jacks, blocking or other cranes.

NEW "DYNAMIC LOAD CONTROL" DEVICE provides power lowering of full 100-ton load at lowering speeds comparable to hoisting speeds. The unit consists of a hydraulic retarder with heat exchanger, and a reversing mechanism with clutch and air controls. A chain drive interlocks main drum with the reversing mechanism which is located on the main drive shaft. The retarder, *not the engine,* absorbs load energy. Line speeds are controlled over a continuous range.

NEWLY ENGINEERED RETRACTABLE HIGH GANTRY reduces overhead clearance to a minimum when traveling. Gantry is quickly and easily raised or lowered by the boom hoist . . . no outside help is required.

NEW OUTSIDE POSITIONING OF CRAWLER DRIVE CHAIN permits crawler units to be removed for job-to-job transport without "breaking" drive chain or crawler pads. (Optional)

AUTOMATIC CLUTCH THROW-OUT LIMIT STOP for safe, close radius booming. This device *automatically* disengages boom hoist clutch when boom approaches a pre-set contact point . . . prevents operator from raising boom beyond safe limits. Also, physical-type pantograph boom stop is an additional safety feature.

INDEPENDENT BOOM HOIST IS STANDARD — has air controls to give the operator greater precision in handling boom and load. Operator has positive control at all times. Available on air-equipped machines only.

WIDE RANGE OF CONTROLS gives operating versatility. Available with air controls *only,* or manual controls *only,* or as a combination machine with *both* air and manual controls.

INDEPENDENT SWING is available as a useful feature for placing steel and "tight quarter" maneuvering. Allows operator to boom, swing, and travel simultaneously.

COMPACT DIMENSIONS for easier between-job shipment. The crane can be carried on standard railroad flat cars, within ordinary rail clearances . . . removing only crawler units, boom, and back hitch.

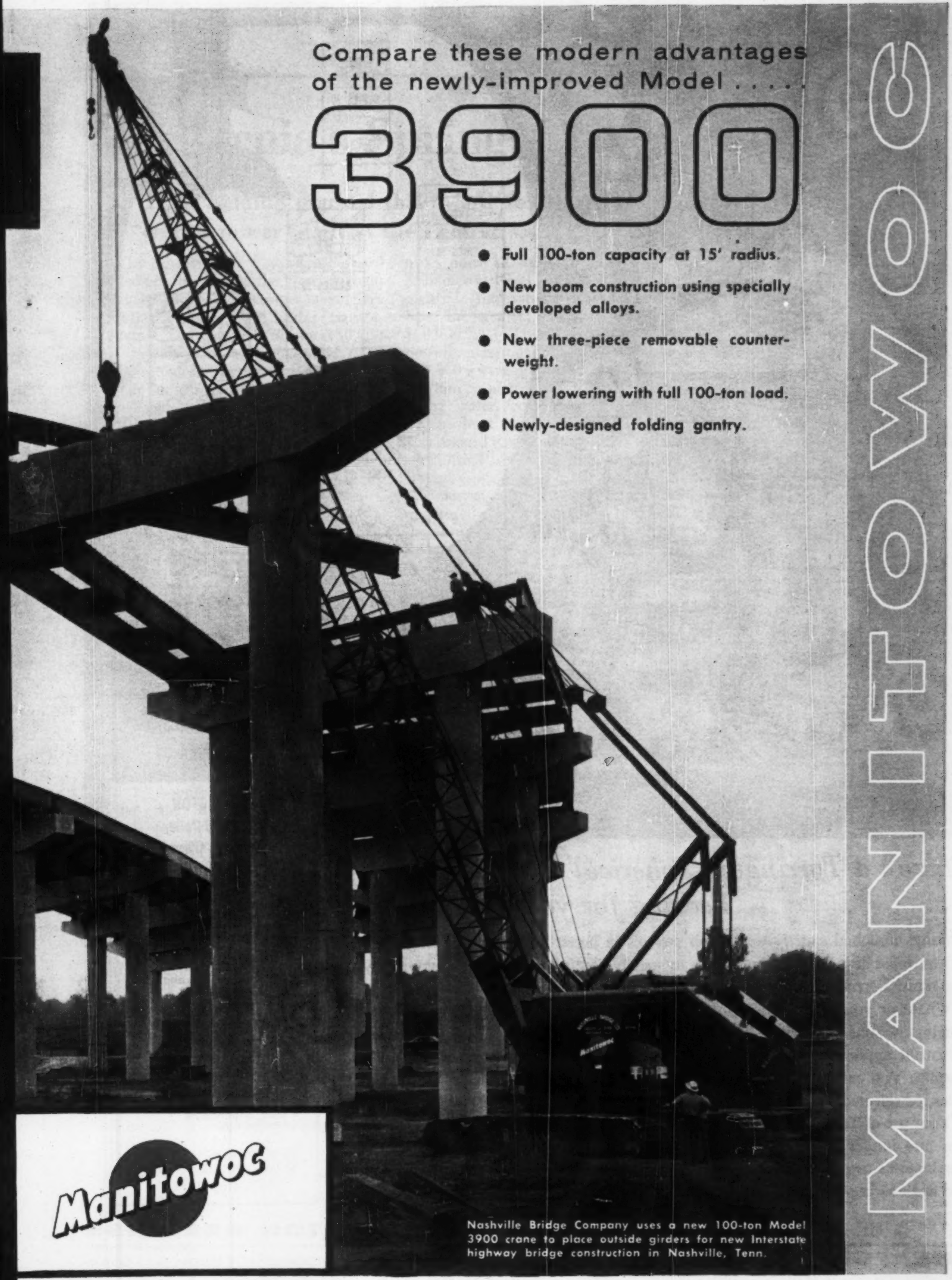
These new and improved features are only a small part of the complete 100-Ton Model 3900 crane story. To learn about the many other advantages you can enjoy, including full convertibility to dragline or clamshell, visit your nearby Manitowoc distributor soon.

MANITOWOC ENGINEERING CORP. 1 K
Manitowoc, Wisconsin Dept. ENR
Gentlemen: I'd like more information on your new 100-Ton Model 3900 crane.
Name
Title
Company
Address
City Zone State

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin

CRANES
25 to 125 TONS

SHOVELS
1¼ to 6 YDS.



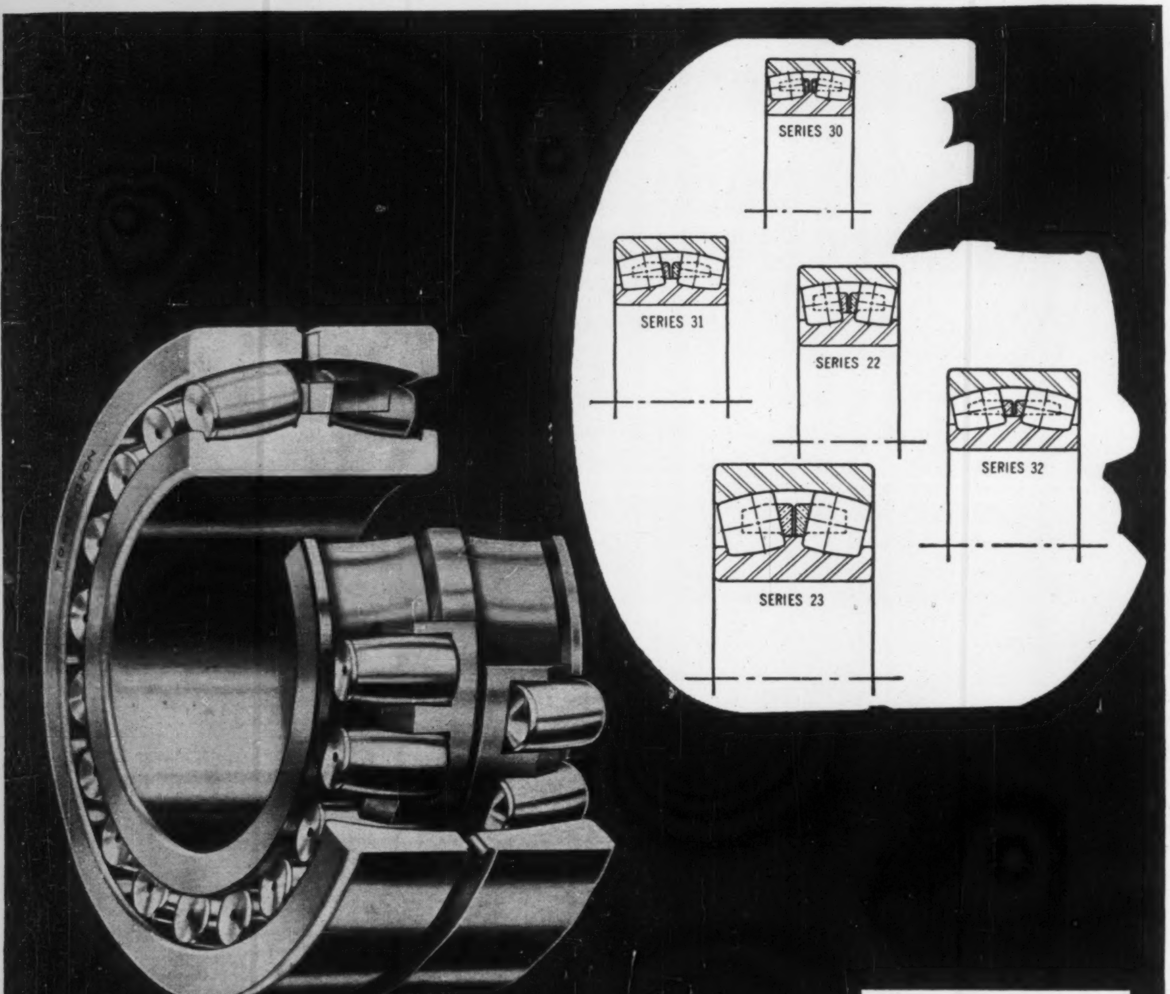
Compare these modern advantages of the newly-improved Model . . . .

3900

- Full 100-ton capacity at 15' radius.
- New boom construction using specially developed alloys.
- New three-piece removable counterweight.
- Power lowering with full 100-ton load.
- Newly-designed folding gantry.

Nashville Bridge Company uses a new 100-ton Model 3900 crane to place outside girders for new Interstate highway bridge construction in Nashville, Tenn.

CIRCLE 73 ON READER SERVICE CARD



TORRINGTON
Spherical Roller
Bearings Offer:

- conformity of rollers to raceways
- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- inherent self-alignment
- even load distribution
- long, dependable service life

Send for new Torrington Spherical Roller Bearing Catalog #258

There's a Torrington Spherical Roller Bearing for your application

Bearings matched *exactly* to the job pay off in better performance, longer life, greater reliability. That's why it pays to specify carefully. And that's why it pays to choose Torrington Spherical Roller Bearings.

Whatever your space limitations or capacity requirements, the five series of Torrington Spherical Roller Bearings provide the right bearing for virtually every industrial application. You can design for straight bore or tapered bore with adapter. You can benefit from extra features such as lubrication groove and oil holes, or selected outside diameters.

Your use of Torrington Spherical Roller Bearings will assure exceptional operation and longer bearing life under the toughest conditions. They're made to Torrington's own uncompromising standards—the highest in the field of anti-friction engineering—by the manufacturer of every basic type of anti-friction bearing.

progress through precision **TORRINGTON BEARINGS**

THE TORRINGTON COMPANY South Bend 21, Indiana • Torrington, Conn.

California's Spring Creek Power Plant

Tight bidding marked this award for the third and largest power plant in the Central Valley system

The Spring-Creek Powerhouse award added another link to the growing chain of dams and power stations making up Central Valley's huge water transfer system. Construction of the 150,000 kw power plant will take about 15 months and cost better than $4 million.

The high priced contract drew seven tight bids. Scheuman & Johnson, Seattle, slipped their winning number through a scant 3% under the second low. The high was out by only 10%, and all bids were under the engineer's estimate.

This contract centers on excavation for the 550-ft tailrace tunnel. The tunnel, for discharge from the turbines, will be completely concrete lined. Excavation accounts for over 14% of the project's cost, and includes a whopping 138,000 cy. More than one quarter of this will be rock excavation for the power plant and miscellaneous structures.

Scheuman & Johnson will install penstocks and butterfly valves under this contract, but heavy power equipment won't be added until later. Most of the heavy equipment to run the plant will be supplied by the government. When the Bureau of Reclamation awards a completion contract at some future date, the U.S. will bring in turbines and generators to put the plant into business.

For the present contract, the government will supply an overhead traveling crane and test weights, two 156-in. butterfly valves and hydraulic control, draft tube bulkhead gates, seat guides and lifting frame, stop log seats and guides, hydraulic oil for butterfly valves, lighting fixtures, and lubricating oil and grease for government-furnished machinery and equipment.

Materials will be hauled by rail and highway to the site of the power plant, about six miles from the railhead.

Spring Creek will be a two generator power plant. Each unit is powered by a 105,000-hp turbine and has a capacity of 83,333 kva. Housing for the generators will be in three parts—reinforced concrete substructure, intermediate structure, and structural steel superstructure.

The plant will be placed about six miles north of Redding, Calif., on the Sacramento River. One of three power plants in the system, Spring Creek will have the greatest generating capacity—150,000 kw. Trinity and Clear Creek powerhouses boast only 100,000 and 134,000 kw respectively.

The completed system is designed to divert water from the Trinity River, which flows to the Pacific, into the Sacramento River, which waters the rich agricultural land of California's Central Valley.

Supervision of bidding and construction for all the Trinity projects is under the Bureau of Reclamation's Trinity River Division, Lewiston, Calif.

Hourly wage rates include: skilled labor, $4.031; semi-skilled, $3.73; and common labor, $3.045.

The bidding included:

1C	Scheuman & Johnson, Seattle, Wash	$4,126,456
2	Winston Bros. Co., Green Const. Co., Johnson, Drake & Piper, Inc., Minneapolis, Minn.	4,240,061
7	Shea-Kaiser-Morrison, Alhambra, Cal.	4,593,273
EE	Bureau of Reclamation	4,467,770

Bids: 6-15-60		Quan-	Unit Prices	
Items	Unit	tity	1C	2
Fdn, unwatering	ls	job	$75,000	$100,000
Exc, common[a]	cy	47,500	2.50	3.50
rock[a]	cy	38,200	5.00	3.50
drilling holes	lf	4,300	1.50	1.00
of gouge material	cy	40	20.00	15.00
unclassified[b]	cy	33,000	4.00	3.50
unclassified[c]	cy	17,000	4.00	3.50
from borrow	cy	2,100	1.50	1.25
Backfill	cy	29,500	1.00	1.25
free-draining	cy	4,600	3.00	1.75
compacting	cy	34,100	1.50	0.65
rock	cy	1,500	1.50	2.05
Embankments, compacting	cy	2,100	1.00	1.00
Riprap	cy	160	6.00	8.50
sand & gravel bed	cy	70	5.00	8.50
Holes, weep[d]	ea	4	10.00	60.00
drilling[e]	lf	1,880	4.00	1.60
CCP, 21" ϕ	lf	170	8.00	9.00
Guardrail, beam-type	lf	460	4.00	5.00
end sections	ea	6	50.00	10.00
CMP	ls	job	150.00	150.00
culv, remove exist	ls	job	400.00	750.00
Cement	bbl	34,500	5.30	5.00
Bars, reinforcement	lb	1,806,000	0.13	0.115
Conc, first-stage in pwr plant substructure	cy	3,200	35.00	35.00
intermediate str	cy	6,000	50.00	55.00
Filler, corkboard jt 1"	sf	2,380	1.00	2.00
elastic mat in jt ½"	sf	20	1.50	2.15
1"	sf	195	2.00	2.00
Waterstops, rubber tp E	lf	590	4.00	7.00
tp F	lf	790	3.00	4.00
Jt strips, rubber	lf	60	2.00	1.30
Rubber sheet in jts	sf	270	2.00	5.00
Metal seals tp N2	lf	3,370	2.00	2.20
Masonry walls, reinforced grouted	sf	6,450	3.00	4.20
Dampproofing, coal-tar emulsion	sy	3,500	1.20	0.80
Concrete in, penstock vlv str	cy	490	45.00	70.00
anchor, pier, & encasemnt.	cy	7,000	30.00	26.00
drainage str	cy	425	90.00	100.00
blockouts	cy	30	100.00	140.00
Conc floor hardener 2-coat	sy	730	1.00	1.20
Sheathing, wood roof	Mfbm	37.5	220.00	270.00
Roofing, built-up, 4-ply asph-saturated felt	sf	12,200	0.50	0.42

Bids: 9-15-60		Quan-	Unit Prices	
Items	Unit	tity	1C	2
Steel, pwr plnt superstr	lb	775,000	0.21	0.19
siding	sf	12,600	1.20	1.25
rolling door	sf	485	8.00	6.00
swinging door, industrial tp	sf	63	8.00	7.00
windows	sf	3,800	3.50	3.40
Louvers, fix, stormproof	sf	37	8.00	8.00
auto, & back press dmprs.	sf	53	15.00	11.00
Pipe, met, embedded & ftgs under 6" ϕ	lb	13,000	0.50	0.43
6" & larger ϕ	lb	27,000	0.40	0.32
Vlvs, under 6" ϕ	lb	600	1.00	1.80
6" & larger ϕ	lb	2,000	1.00	1.20
(2) draft-tube, unwatering	ls	job	2,000	840.00
Drainage sys, emergency	ls	job	5,000	3,250
CIP soil, & ftg san sys	lb	1,000	0.70	0.41
WIP galv, & ftg 6" and under in nominal ϕ[f]	lf	7,000	0.70	1.30
Steel pipe, galv, & ftg 4" and under in nominal ϕ[g]	lb	1,000	1.00	1.10
Metalwork, misc in pwr plnt	lb	15,000	0.70	0.75
Tanks, oil storage (2)	ls	job	7,000	4,800
Vlv penstock, & storm dr byp str metalwork	lf	21,100	0.25	0.75
Louvers, fix stormproof for penstock vlv str air-vlv chamber	sf	150	7.00	8.00
Crane, installing	lb	300,000	0.04	0.07
testing	ls	job	2,000	3,600
Steel penstocks[h]	ls	job	1,350,000	1,384,500
Vlvs, butterfly (2) 156"*	ls	job	20,000	20,000
Sys, control, hyd for (2) 156" butterfly vlvs*	ls	job	4,000	2,600
Gate, (4) draft-tube bhd*	ls	job	4,000	3,800
Seats & guides[i]*	lb	29,000	0.21	0.26
Hoist, 6-ton[j]	ls	job	5,000	5,000
Lifting frame (1) for draft-tube bhd gates*	ls	job	200.00	650.00
CIP soil, 4" ϕ, & ftgs[k]	lf	100	1.00	2.10
Tile, drain, 4" ϕ[l]	lf	90	1.00	2.60
Gvl in absorbtion trench	cy	10	8.00	7.50
Grounding systems	lb	8,000	2.50	2.10
Steel cond rigid, elec embedded, ½" ϕ	ft	300	1.40	1.30
¾" ϕ	ft	6,500	1.50	1.60
1" ϕ	ft	700	1.90	1.85
1½" ϕ	ft	2,000	2.50	3.70
2" ϕ	ft	800	3.00	3.15
2½" ϕ	ft	300	5.00	4.20
3" ϕ	ft	200	6.00	5.25
4" ϕ	lf	100	8.00	10.50
exposed, ¾" ϕ	lf	250	2.00	1.70
1" ϕ	lf	140	2.00	1.95
1½" ϕ	lf	40	3.00	2.50
2" ϕ	lf	20	4.00	3.25
Outlet box, cast, No. 1	ea	130	12.00	26.00
No. 2	ea	150	15.00	30.00
Box, tp FD, exterior recp	ea	6	25.00	31.50
Lighting fixtures tp A	ea	14	15.00	10.50
tp J	ea	8	75.00	80.00
Pwr recp 440-v, 60-amp[m]	ea	7	75.00	65.00
100-amp[m]	ea	3	100.00	105.00
Cond 600-v ins[n]	lb	350	3.00	7.00
Wiring devices[n]*	ea	10	10.00	10.50
Lighting fixtures, incand lamp-tp[n]*	ea	14	10.00	13.00
Elec equipment[n]*	lb	380	0.20	2.10
Exc, in tunnel	cy	10,400	22.00	40.00
for tunnel enlarge	cy	25	33.00	30.00
Drill feeler or pilot holes before tunnel exc	lf	75	6.00	40.00
Steel, str, tunnel supts	lb	210,000	0.30	0.15
Bolts, tunnel rock	lf	700	3.00	2.25
Woven-wire fabric, chain-link, for tunnel rock bolt supts	lb	250	0.60	0.60
Timber, in tunnel	Mfbm	26	275.00	165.00
Conc, in tunnel lining	cy	2,400	40.00	30.00
in tailrace tunnel inlet & outlet str.	cy	2,850	55.00	50.00

Completion time: 440 calendar days
Liquidated damages: $480 per day

* Installation only

a for power plant & misc str b for penstocks, penstock vlv str, & penstock anchors, piers, and encasements c for tailrace tunnel outlet d for penstock vlv str retaining wall e for anchor bars and grouting bars in place f for roof drainage sys g for sanitary sys h complete with accessories i for stoplogs and for draft-tube bhd gates j for draft-tube bhd hates k for sew outlet pipe l for absorbtion trench m complete with enclosures and matching plugs n in penstock vlv str

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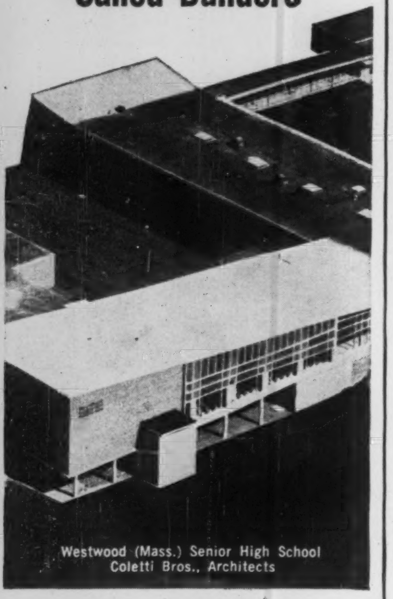

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$3.4-million repair contract for . . .

Hood Canal Floating Bridge

With pontoons cracked by last February's storms, the $14 million Hood Canal Bridge has been waiting for the courts to free it for repairs. Yuba Consolidated Industries, Inc., holds the $3.4-million repair contract, but was unable to begin work until the Toll Bridge Authority settled with Morrison-Kaiser-Puget Sound-General, the joint venture holding the original construction contract.

Agreement was finally reached on October 26 to pay $675,472 to the contractors; the settlement is plus the $14-million contract the combine has been working on since 1958. About $500,000 in claims remains to be settled, but the contractors will turn the eighteen completed pontoons over to Yuba under the terms of the agreement.

The authority called for new bids when the combine claimed repairs and modifications would top $9 million. Consultants Howard, Needles, Tammen & Bergendorff favored a price more in the neighborhood of $4 million. Yuba Consolidated managed to bid in the right neighborhood, and also to under bid the closest of four competitors (Healy-Raymond, San Francisco) by 10%.

When Yuba finally gets the nod, it will have the job of strengthening, repairing, and modifying the damaged pontoons. These cellular constructed pontoons are part of the 1.2-mile floating section of the bridge. Six of the 50 x 360-ft pontoons were cracked and chipped when high winds and rough waters bumped their ends together.

Strengthening the bridge will require twelve 40-strand wire prestressing cables placed near the top slab, and twelve more placed near the bottom. The cables will run lengthwise from one end of the bridge to the other.

To string the cables, about 10,000 4½-in. and 8-in. dia holes will have to be cored through the existing bulkheads. New heavy jacking bulkheads will then be constructed within the pontoons to serve as anchors for the cable.

Once the cable is anchored, major repair work on the joints can get underway. The joints between the individual pontoons will be grouted with epoxy-resin. Each joint will also be tension-bolted and prestressed with cable.

Prices bid for preparing and heating the joints before grouting showed an unusually wide spread. Yuba jumped from $4,000 above to $8,000 below prices bid for joint preparation by the other three entrants.

Similarly, Yuba's heating prices ranged from a hefty $1,200 to $4,000 under the others.

The contract was originally scheduled to begin Oct. 15. The starting date is still anybody's guess, but now that the bridge is in Yuba's hands the five remaining pontoons should be completed by next March.

Some minimum wage rates holding for bridge work: cement hogs, $3.95/hr; carpenters, $4.15; general laborer, $3.25; crane operators, $3.84-$4.18; heavy duty mechanics, $3.84.

The bidding included:

1C	**Yuba Consolidated Industries, Inc., San Francisco, Calif**	**$3,445,000**
2	**Healy-Raymond, San Francisco, Calif**	**3,827,730**
4	**McDowell Co., Inc., Cleveland, Ohio**	**4,529,733**
EE	**Howard, Needles, Tammen & Bergendoff, New York, N. Y.**	**4,000,000**

Bids: 8-23-60 Items	Unit	Quantity	Unit Prices 1C	 2
Tendons, 40-wire	lf	158,980	$7.30	$6.20
protective ct	lf	152,320	1.30	0.80
Holes, cored 4½"ϕ	ea	9,372	15.00	10.50
8"ϕ	ea	880	20.00	17.00
sealing 4½"ϕ	ea	2,820	22.00	30.00
at saddles	ea	408	19.00	31.00
Shields, tendon	lf	1,000	3.50	2.00
Joint prep, pontoon				
std size	face	18	6,820	7,500
jts I-J & O-P	face	4	3,900	11,250
jts J-K & N-O	face	8	4,800	5,000
jts M-MM & L-LL	face	4	3,900	6,400
aux pontoons to A & U	face	4	3,250	8,000
Joint, heating				
std size	ea	9	1,900	4,700
jts I-J & O-PP	ea	2	453.00	4,700
jts J-K & N-O	ea	4	446.00	4,700
jts M-MM & L-LL	ea	2	453.00	4,700
Grout, epoxy	cf	1,615	73.00	85.00
Seals, rubber 2" x 3"	lf	1,365	7.00	7.00
Metalwork, structural	lb	780,000	0.38	0.45
Steel castings	lb	73,260	0.80	0.75
Bolts, high strength, f&i	lb	19,360	1.60	1.25
i	ea	784	11.50	12.50
alloy steel, f&i	lb	15,630	2.10	1.20
Steel, reinforcing	lb	405,000	0.20	0.25
Concrete, removal	cy	130	144.00	300.00
PCC, class A	cy	670	179.00	180.00
Doors watertight,				
relocation	ea	12	404.00	275.00
hinge modification	ea	40	36.00	100.00
Hatches, relocate	ea	18	490.00	300.00
waterproof	ea	375	39.00	9.00
Keys, sawed shear	lf	2,040	11.0	4.25
Guides, vertical, add	lb	45,000	0.56	1.60
Bumpers, rubber pontoon	ls	job	880.00	7,030
rdwy joint	ls	job	200.00	1,000
tmbr, revise existing	ls	job	600.00	1,000
Strong back, assembly	ls	job	61,184	53,000
installation	ea	7	4,000	6,200
Holes, for bolts & tie rods	ea	4,200	5.00	5.00
Riprap, plant	ls	job	50,000	80,000
0–150′ depth	t	5,000	12.00	17.00
150′–250′ depth	t	1,600	19.00	28.00
over 250′ depth	t	600	55.00	40.00
Anchor sn, anchorage				
assembly	ls	job	12,234	28,000
cable	lf	2,140	5.00	8.00
Anchor cable, attach	ls	job	68,000	150,000
Yokes, piers 3 & 4	ls	job	7,000	3,000
Aux pontoons,				
concrete	cy	575	218.00	175.00
waterproofing	sy	980	1.50	4.00
seals, rubber 2½" x 2"	lf	280	6.50	6.00
fenders	Mfbm	9.4	720.00	800.00
Pontoons, handling & assembling	ls	job	218,000	465,863
Gravel ballast	t	2,000	18.00	23.00
Epoxy resin adhesive added (or deducted)	gal	100	15.00	15.00
P cmt added (or deducted) in conc mixes	bbl	300	5.00	5.00

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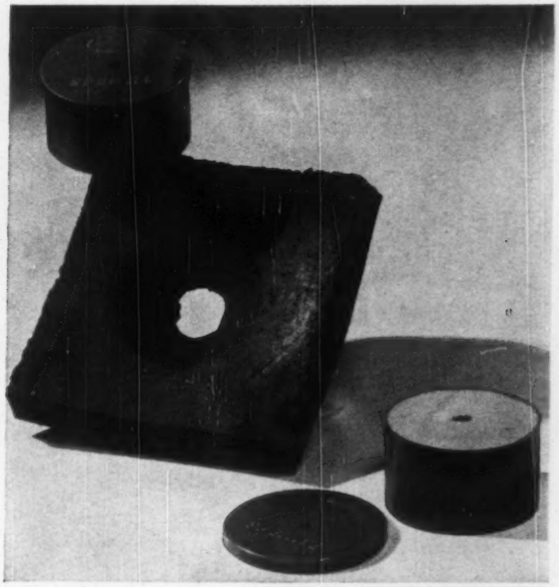

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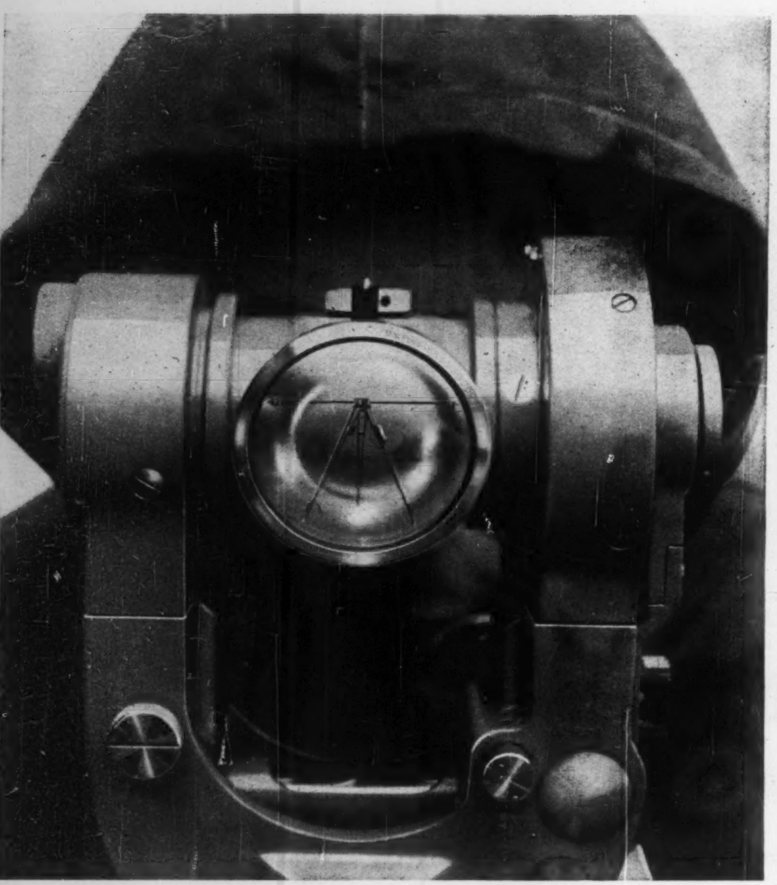

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Low Is Just 2% Under Second Bid for Sewer Job

This $165,935 sanitary sewerage system will provide for present and future sewerage needs of the residents of the Jackson Avenue-Ridgewood Terrace and Lionshead Lake areas of Wayne Township, the proposed new administrative office building of the American Cyanamid Co., and the existing Pines Lake School.

Low bid for the sewerage system was entered by Park Place Construction Co., Hawthorne, N. J. The second low was just 2% above the winning bid. Lee T. Purcell, Paterson, N. J., is the consultant for the owner, Wayne Township Sanitary Sewer Improvement Project.

Fill concrete will be a 1:3:5 mix with a 28-day compressive strength of 2,000 psi; reinforced concrete will have a 28-day compressive strength of 3,500 psi.

Base wages and fringe benefits prevailing in this area include: bricklayers and cement finishers, $4.45/hr plus $0.12 walfare fund and $0.10 pension fund; carpenters, $4.18 plus $0.15 WF and $0.10 PF; and laborers, $3.30 plus $0.10 WF and $0.10 PF.

The bidding included:

1C	Park Place Const. Co., Hawthorne, N.J.	$165,935
2	Jos. Della Penna Const. Co., Haskell, N.J.	169,834
9	P. T. & L. Const. Co., Paramus, N.J.	253,212
EE	Lee T. Purcell, Paterson, N.J.	200,000*

Bids: 9-13-60 Items	Unit	Quantity	Unit Prices 1C	 2
Exc, trench, and bf				
to 10′ deep	lf	8,370	$.100	$2.95
10′-14′	lf	1,950	2.00	4.70
14′-18′	lf	380	4.00	9.00
18′-20′	lf	150	4.00	11.00
20′-22′	lf	180	4.00	12.00
22′-24′	lf	110	4.00	14.00
rock	cy	1,200	20.00	15.00
for test holes	cy	60	5.00	3.00
Timber sheeting, lip	Mfbm	100	250.00	125.00
MH, standard	ea	31	300.00	325.00
drop	ea	9	300.00	400.00
flush	ea	2	270.00	295.00
air valve	ea	1	610.00	400.00
Stone, crushed, fdn & drainage	t	600	7.00	5.50
Conc, cradle	cy	60	40.00	50.00
curbing	lf	60	4.00	3.50
Fill	cy	2,400	1.10	2.50
ACP cl 2400, 8″	lf	4,230	2.65	1.77
10″	lf	189	3.00	2.10
12″	lf	305	3.50	2.81
cl 3300, 8″	lf	1,830	2.75	1.86
cl 100, water pipe 8″	lf	670	2.30	2.19
CIP cl 150,[a] 8″	lf	42	3.20	3.34
6″	lf	4,355	3.00	2.62
AC connections				
Y-branch 8″x8″x6″	ea	70	15.00	45.00
pipe, house 6″	lf	1,200	4.00	3.50
Trench, wellpointed				
to 14′ deep	lf	2,900	5.00	4.00
14′-18′	lf	60	2.00	7.00
18′-22′	lf	70	3.00	8.00
22′-24′	lf	25	1.00	10.00
Pvt, temporary	sy	3,475	1.50	1.50
restore penetration	sy	4,315	4.00	3.50
conc, sawing	lf	380	0.30	1.00
removing	sy	85	5.00	8.00
replacing	sy	85	7.00	12.00
Stone, shoulder	t	235	5.00	7.00

* Includes pumping station not part of this contract.

[a] Federal specification WW-D-421, Tp II.

Completion time: 2/15/61 everything but permanent pavement placement.
6/1/61 permanent pavement placement

Excavation Prices Vary Most in Grade Separation

This $122,829 steel and concrete overpass and $386,450 concrete underpass will carry Forest Park Parkway over the Wabash Railroad and under Kingshighway Boulevard in St. Louis.

The contract for both structures went to Gamble Const. Co., Inc., of St. Louis at a price 9.3% under the second low and 41.9% below the high of eight bidders.

Footing excavation ranged from $4.25 to $19.50 on the overpass and from $2.25 to $9.20 for the underpass.

Wages for the St. Louis area include: carpenters, $3.825; ironworkers, $3.85; plumbers, $4.15; plumbers helpers or laborers, $3.20; stone masons, $4.05; asphalt roller operator, $3.95; concrete mixer, $3.95.

The bidding included:

1C	Gamble Const. Co., Inc., St. Louis. Mo	$509,279
2	Latta Bridge Co., Inc., St. Louis, Mo	556,851
8	Samuel Kraus Co., St. Louis, Mo	722,651
EE	Theo. A. Beffa, chief engineer, St. Louis, Mo	750,000

Bridge Over Wabash Railroad

Bids: 8-9-60 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, footing	cy	380	$15.00	$6.50
Files, steel, f & drive	lf	2,580	6.20	5.40
steel cut-offs	lf	220	5.00	3.60
Conc, cl I	cf	5,945	3.00	3.50
cl II	cf	6,755	2.00	3.00
cl III	cf	1,125	2.00	1.50
Steel, reinforcement	lb	98,970	0.16	0.15
structural	lb	258,900	0.16	0.18
Surface finish	sf	5,110	0.30	0.25
Waterproofing, cold application	sf	1,400	0.16	0.14
Painting	ls	job	1,900	2,200
Aluminum handrail	lf	304	6.20	5.70
Excavation, sewer	cy	80	5.00	7.00
Pipe, vitrified 18"	lf	162	7.50	6.70
Fertilize, seed, & mulch	acre	1	600.00	600.00
Trees, remove	ea	1	125.00	300.00
protect	lf	24	4.00	2.40
Conduit system	ls	job	1,201	1,600

Kingshighway Bridge & Approach

Bids: 8-9-60 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, general	cy	30,600	$1.70	$1.90
footing	cy	3,120	6.00	3.80
shaft	cf	5,750	0.60	0.85
rock	cf	500	10.00	6.00
Drill rock	lf	50	5.00	10.00
Sheeting & shoring	ls	job	7,800	8,900
Concrete, cl II	cf	68,950	1.40	1.90
cl III	cf	25,430	0.80	0.90
cl IV	cf	6,230	0.60	1.00
sidewalk	sf	510	2.00	1.20
median strip	lf	285	4.20	6.00
Steel, reinforcement	lb	347,900	0.16	0.16
grates	lb	350	0.40	0.60
Surface finish	sf	31,000	0.30	0.25
Waterproofing, fabric	sf	1,630	0.31	0.55
cold application	sf	29,610	0.16	0.14
Pipe, perf corrugated	lf	1,530	2.00	2.00
Fill, porous	cy	1,550	5.10	7.80
Aluminum handrail	lf	1,304	6.20	5.70
Macadam, waterbound, base course	sy	20	10.00	6.00
Curb & gutter comb	lf	1,500	3.00	5.80
Concrete base course 8"	sy	5,135	6.00	4.90
10"	sy	585	15.00	14.00
Asph conc surface course	t	710	8.00	10.50
Excavation, sewer	cy	1,850	5.50	4.90
RCP 12"	lf	620	4.80	3.90
18"	lf	680	12.00	6.60
Masonry, brick	cf	915	3.40	3.20
Cast iron	lb	1,510	0.20	0.14
Sodding	sy	100	1.00	1.20
Fertilize, seed & mulch	acre	1	600.00	600.00
Trees, protect	lf	24	4.00	2.40
remove	ea	1	125.00	300.00
Conduit system	ls	job	11,374	15,050

Completion time: 600 calendar days
Liquidated damages: $80 per day

BIG

in QUALITY and ECONOMY

OWEN

OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets —and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
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THE TRAVELERS
Insurance Companies HARTFORD 15, CONNECTICUT

CIRCLE 80 ON READER SERVICE CARD

Oregon Canal Cuts Through Irrigated Area

This $322,080 distribution canal for the Bureau of Reclamation's Crooked River Project in Central Oregon will have 9 ft, 6 ft, and 4 ft base widths, and center cuts of 15 ft and 5 ft. Some construction difficulties may arise when the canal is cut through already irrigated areas where wooden bridges, irrigation inlets, crossovers must be bypassed.

Minimum wage rates specified by the government include: carpenters, $3.46/hr; general laborers, $2.75; air compressor operators, $3.39; crane operators, $3.93.

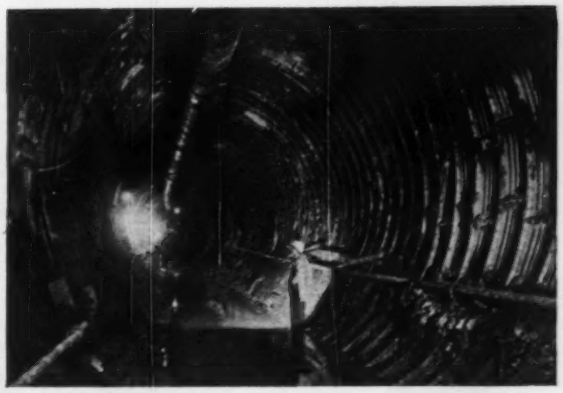
The bidding included:

1C	Contractors & Excavators, Inc., Helena, Mont.	$332,080
2	A & B Construction Co., Helena, Mont.	355,070
7	Syblon-Reid Construction Co., Prineville, Ore.	441,561
EE	Bureau of Reclamation	383,08

Bids: 8-4-60		Quan-	Unit Prices	
Items	Unit	tity	1C	2
Excavating:				
for canal, common	cy	183,000	$0.28	$0.23
rock	cy	1,000	1.60	0.60
for str, common	cy	14,600	0.80	1.00
rock	cy	250	1.60	2.00
from borrow	cy	1,000	0.26	0.22
Compacting, embankments.	cy	43,900	0.30	0.30
bf about str	cy	3,300	2.90	3.00
Bf about str	cy	7,800	0.45	0.50
Overhaul	yml	2,600	0.26	0.30
Riprap	cy	140	5.00	7.00
Sand & gvl bed for riprap	cy	62	4.00	5.00
Gvl, crse, protection	cy	200	4.00	5.00
Holes, weep	ea	6	30.00	50.00
Sur, tmbr farm bri	cy	150	5.00	6.00
Lining, blended earth				
placing	cy	6,200	0.40	0.50
compacting	cy	6,200	0.40	0.40
refill above	cy	1,660	0.30	0.40
Exc & refill of inspection trenches	cy	13	10.00	10.00
Gvl blanket	cy	500	4.00	4.20
Conc, in str	cy	823	98.00	103.00
Cement	bbl	1,235	7.50	7.00
Bars, reinforcement	lb	68,000	0.18	0.20
Conc, remove existing	ls	job	800.00	500.00
Waterstop, rubber tp H 6"	lf	7	7.00	7.00
Tmbr in str, untreated	Mfbm	2.9	250.00	300.00
treated	Mfbm	193	270.00	315.00
CMP, 16-gage, 12" ϕ	lf	430	3.80	3.50
15" ϕ	lf	104	4.00	4.00
18" ϕ	lf	634	4.75	5.00
21" ϕ	lf	74	5.45	5.50
14-gage, 12" ϕ	lf	98	3.85	4.00
15" ϕ	lf	24	4.50	4.70
18" ϕ	lf	120	5.45	5.50
21" ϕ	lf	14	6.25	8.00
30" ϕ	lf	246	8.75	10.00
Conc culv pipe, cl III				
42" ϕ, erect vertically	lf	8	15.00	30.00
15" ϕ	lf	460	4.20	6.00
18" ϕ	lf	392	5.00	6.50
21" ϕ	lf	36	6.10	7.00
24" ϕ	lf	629	7.30	9.00
30" ϕ	lf	32	10.00	12.00
36" ϕ	lf	36	12.70	16.00
Conc pressure pipe 60" ϕ, sym 60 A25, or pretensioned conc pipe sym 60PT200	lf	202	37.50	44.00
sym 60A50, or pretensioned conc pipe sym 60PT200	lf	670	37.50	44.00
sym 60B50, or pretensioned conc pipe sym 60PT250	lf	121	37.50	44.00
CI slide gates & lifts				
15" ϕ	ea	26	82.00	85.00
18" ϕ	ea	13	108.00	125.00
21" ϕ	ea	2	122.00	135.00
24" ϕ	ea	3	130.00	145.00
30" ϕ	ea	2	242.00	200.00
Steel slide gates & lifts				
30" x 36"	ea	2	165.00	250.00
Weirs & lifts adjustable				
2'	ea	16	95.00	125.00
3'	ea	4	105.00	125.00
Pipe welded steel, 10-gage				
12" ϕ	lf	176	6.00	10.00
18" ϕ	lf	234	9.80	15.00
21" ϕ	lf	31	12.00	20.00
30" ϕ	lf	84	25.00	40.00
Blow-off assembly	ls	job	600.00	600.00
Metal railing, bri	lf	370	4.00	4.00
Metalwork, misc	lb	4,800	0.70	0.75

Completion time: 360 calendar days
Liquidated damages: $125 per day

18½ ft. tunnel portal – Terrain shows tunneling conditions encountered.



Plates installed quickly – Necessary for immediate ground support. All bolting is in the open through inside flanges – note staggered joints.

Interior of 9½ ft. tunnel – COMMERCIAL tapered plates provide contiguous lining at lateral curves.

How Liner Plates Lick Mud, Water, 60-Ton Boulders!

The scene: Bull Run Dam Project, Sandy, Oregon. Tunnel Contractor: Gates & Fox Company, Burlingame, California. Tunnel Project Engineer: Mr. E. M. Woodward.

The problem: Two 1,720 ft. tunnels had to be dug to create dry site for building of dam. One diversion tunnel to be 18½ ft. in diameter; the other, a water supply tunnel, 9½ ft. in diameter with 3 lateral curves. Tunnels were 80 to 100 ft. beneath surface of semi-liquid, rhombohedron earth, liberally salted with angular, 100 lb. to 60 ton basaltic boulders. Areas of high-point pressure loading from unsupported rock and overflow from an underground lake further complicated matters.

The solution: The 18½ ft. tunnel was supported by 15,000 COMMERCIAL 5/16" thick liner plates. Each course consisted of 18 full plates 16" x 37½" and 1 half plate 16" x 18¾" to form a complete circle. The 9½ ft. tunnel took 13,000 plates 3/16" thick (9 full and 1 half plate) similarly arranged and, where necessary, tapered to fit 3 lateral tunnel curves. All courses were mined in with staggered joints so no continuous longitudinal seam ran farther than the 16" plate width.

Plates in both tunnels were pierced with 2" grout holes to allow gravel-cement fill outside liner. Well bundled COMMERCIAL liners handled well and fit perfectly, aiding in progress of 12 ft. per 24 hours in large tunnel, 20 ft. per 24 hours in smaller tunnel.

Technical service backs the product: According to Project Engineer E. M. Woodward, "COMMERCIAL SHEARING provides excellent service, superior product design and on-the-spot engineering help for tough situations. They proved they're not the kind of firm to just ship the plates and forget the project... their service was both impressive and expert!"

For complete details on how COMMERCIAL steel liner plates can simplify and speed up your vertical shaft, surface or sub-surface tunnel project —help make it safer—send today for your copy of Catalog 300-C2. Write to Commercial Shearing & Stamping Co., Dept. E-52, Youngstown, Ohio.

COMMERCIAL
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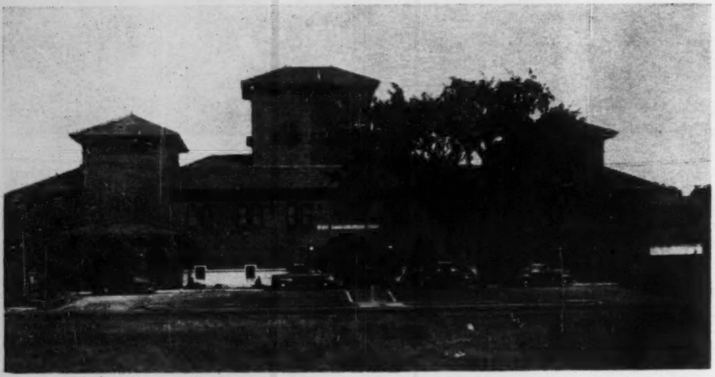
Use Northern Gravel for Rapid Sand Filter



Above is the Grand Rapids, Michigan Filtration Plant. W. L. Harris, the Water Plant Supervisor says: "The Northern Gravel Co. has given us excellent service during the more than 20 years that it has supplied our filter media needs. Our laboratory tests have indicated that its products may be depended upon to meet our specifications."

Filter Sand Specifications are carefully laid out. The Effective Sizes and Uniformity Coefficients used by Consulting Engineers and also recommended by the American Water Works Association are the result of long years of research and experience.

The Northern Gravel Company is equipped to give you prompt shipment whether it be one bag or many carloads, exact to specifications. Filter sand can be furnished with an effective size between 0.35 MM and 1.20 MM.

Chemical Quality of the filter sand is also important. It must be hard, not smooth, and free of soluble particles. This requires perfect washing and grading facilities. We have every modern device for washing, drying, screening and testing.

Filter Gravel supporting the Filter Sand Bed must be, in turn, properly graded to sizes calculated to support the Filter Sand, and be relatively hard, round and resistant to solution.

Northern Gravel has no equal in facilities and our reserves of both sand and gravel are inexhaustible. Northern Gravel Company has been in business over 40 years. We guarantee uniformity of products and our records enable us to duplicate your requirements on short notice. Our location is central and we have commodity rates in every direction.

Northern Gravel Company
Muscatine, Iowa
Box 307
Phone: Amherst 3-2711

Structural Plate Pipe Arch For Maine Highway Bridge

The award for this structural plate pipe arch bridge and 800 ft approach road went to the low of seven bidders, Stuart, Torno & Stuart, East Lebanon, Me., for $19,824.

Tucker Brook Bridge and its approach road are being built on routes 11 and 113 in Standish, Cumberland Co., Me., for the Maine State Highway Commission.

Minimum wage rates on this job include: common labor, $1.25/hr; semiskilled, $1.44; and skilled, $1.88.

The bidding included:

1C	Stuart, Torno & Stuart, East Lebanon, Me.	$19,825
2	C. W. Qualey, Gray, Me.	21,411
7	Susi Construction Co., Pittsfield, Me.	25,928

Bids: 9-21-60 Items	Unit	Quantity	Unit Prices 1C	 2
Trees, remove 9"-24"	ea	2	$50.00	$50.00
over 24"	ea	2	75.00	80.00
Exc, earth	cy	1,160	0.55	0.90
str, drainage	cy	165	2.00	2.00
Borrow, common	cy	1,450	0.45	0.75
granular	cy	195	0.75	1.00
Gvl base crse, place meas.	cy	1,850	0.95	1.25
Overhaul, in place meas	ymi	4,100	0.10	0.10
pit meas	ymi	400	0.08	0.08
Gvl surface, crse	cy	215	2.25	3.00
Bit conc surface crse tp B	t	365	12.20	12.60
Road tar	gal	1,100	0.35	0.40
CMP 18"	lf	142	4.00	4.00
Catch Basin tp E	ea	1	300.00	350.00
Underdrain, tp C 12"	lf	270	3.50	3.75
Span 12'6", 7'11" rise str-plate pipe arch	lf	66	76.00	75.00
Superstructure, remove exist	ls	job	200.00	200.00
Traffic, maintain, 14' rdwy width	ls	job	500.00	250.00
Rail, guard, tp A	lf	350	1.60	1.50
anchor tp A	ea	4	32.00	30.00
Riprap, hand laid	cy	75	8.00	10.00
Borrow, loam	cy	160	2.25	2.75
Sodding	sy	470	1.25	1.40
Seeding, Method #2	unit	11	10.00	10.00
Hay mulch	t	1	60.00	60.00
Monuments, ROW	ea	4	14.00	14.00
Marker, underdrain outlet	ea	1	6.00	6.00

Completion time: 50 working days
Liquidated damages: $30 per day

River Deepening Contract Draws Only One Bidder

The single bid of $1.455 per cu yd took this $29,100 contract for dredging and deepening the Chadokoin River bed at Jamestown, N. Y. This price was slightly higher than New York's Department of Public Works estimate, but the award was made to Glen H. Solomonson, Lakewood, N. J.

Chadokoin River is the outlet for Chautauqua Lake. To improve small boat navigation, an area about 3,350 ft long must be dredged to a maximum depth of 9 ft below lake surface elevation. The bottom width is 75 ft with 4 on 1 slopes.

Prevailing hourly wage rates for shore work include bulldozer operators and carpenters, $3.55; laborers, $2.625; pump operators, $2.85; tractors, $3.10; truck drivers, $2.55; riggers, $3.84. Dredge operators receive $28.52/8 hr day, and class A tug captains, $28.50.

DRY TO DEPTH:

Stang pumps 35,000 gpm of water to dewater in the treacherous Platte River

Bridge jobs are often dewatering problems and the project pictured above is a case in point. Bridging the Platte River, the twin lane 60′ wide, 1500′ long crossing required 26 piers. The problem of quickly dewatering the sandy site of these piers 18′ below water table without disrupting the planned progress of the contractor was neatly solved by the Stang Corporation. After doing a complete analysis of the project requirements, Stang engineers designed a unique "leapfrog" wellpoint operation whereby five independent systems were placed around the first group of piers and then individually moved up as each successive pier was completed—a fast, efficient and effective dewatering job that let the contractor set up the project on a production basis. Solutions to dewatering problems such as this are the specialty of Stang; through proper engineering analysis and design Stang professionals continually save contractors time, money and trouble. Give them an opportunity to help you on your next dewatering problem. Contact any of their seven national depots and there'll be a man on the job in the morning.

JOHN W.

STANG

CORPORATION • 8221 ATLANTIC AVE., BELL, CALIFORNIA
ENGINEERS & MANUFACTURERS OF DEWATERING
EQUIPMENT, WELLPOINTS & PUMPING SYSTEMS
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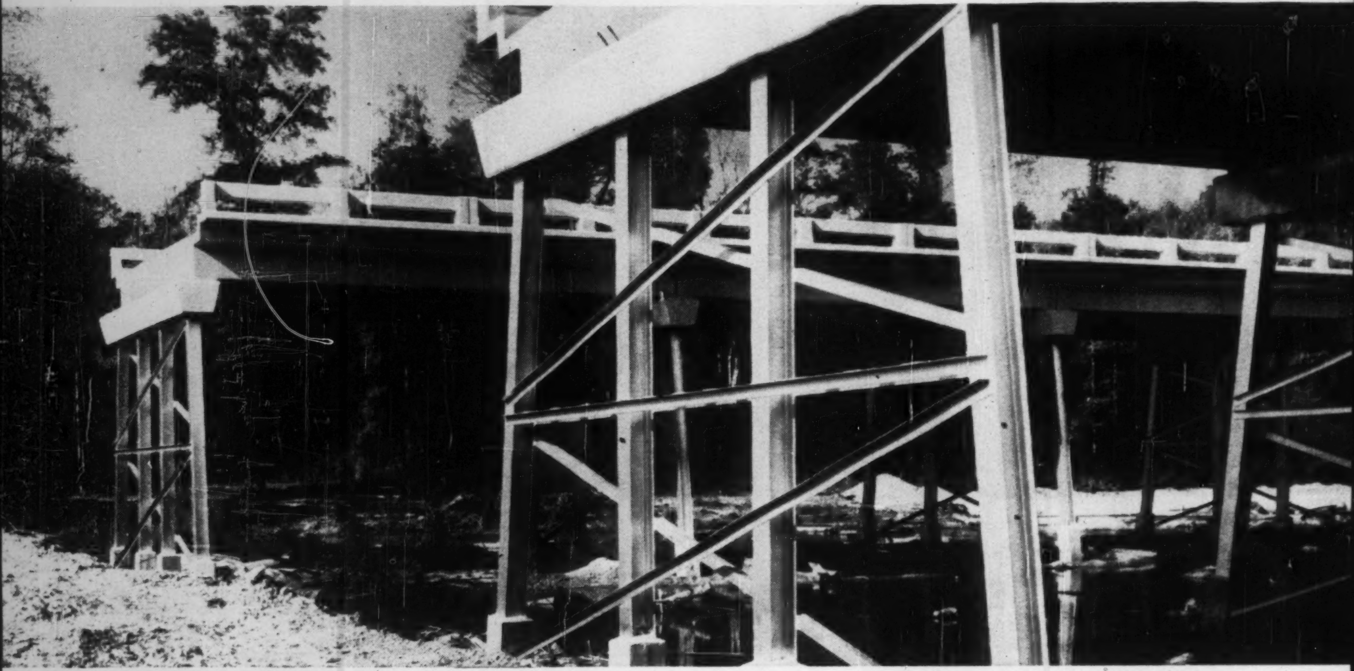
6-09

CIRCLE 83 ON READER SERVICE CARD

U.S. Steel Highway Products help speed Alabama's Interstate Road Program

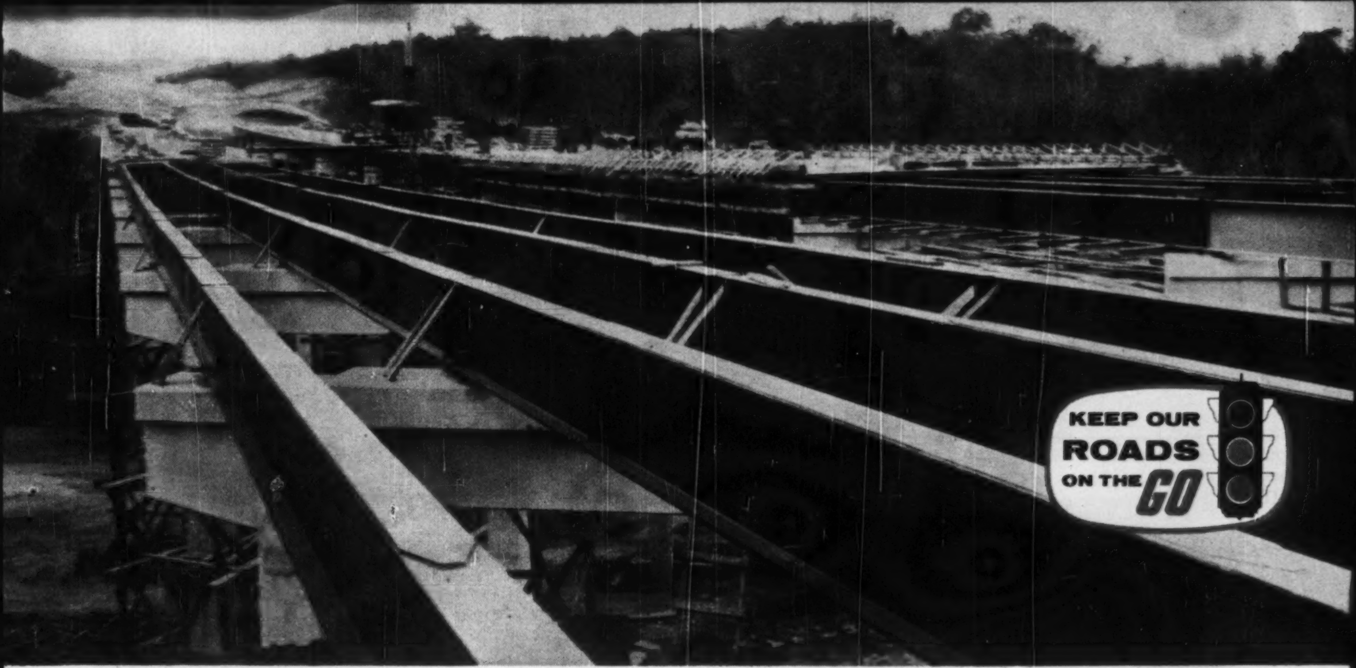


Steel H-Piles support these bridges over Murder Creek in Conecuh County. They will carry traffic through a swampy area between Montgomery and Mobile. H-Piles are ideal here as the trestle bent construction enables the placing of foundation and pier all in one operation. Other USS products on these installations include USS DI-LOK Reinforcing Bars in deck and handrails.

For permanent drainage, Culverts of USS Corrugated Galvanized Culvert Sheets were installed here. Because of its inherent flexibility this culvert can support a heavy load and withstand the vibration and impact of heavy traffic overhead. It will require no maintenance and was easy and inexpensive to install. USS Corrugated Galvanized Culvert Sheets are made from highest quality base metal, rigidly inspected and are guaranteed to meet strict specifications by United States Steel, a company known for quality. In the background (upper left) is a bulldozer that owes much of its stamina (dependable performance), and long life to a number of USS specialty steels that reduce operating weight, add greater strength and cut maintenance costs. These special steels include USS COR-TEN, USS TRI-TEN, and USS MAN-TEN Brands. All are used extensively in modern road-building machinery.

Steel

This mark tells you a product is made of modern, dependable Steel.



A bridge takes shape over the Mulberry Fork of the Warrior River in Blount County, Ala. Modern, long-lasting bridges like this depend on strong USS constructional steels for maximum performance. USS "T-1" Steel, for instance, provides higher allowable working stresses in major tension and compression members, reducing dead load. It can be fabricated in any kind of weather, in any climate. USS Structural Steel Shapes and Plates are available in other High Strength Steels which include USS COR-TEN, USS TRI-TEN and USS MAN-TEN Brands, as well as USS carbon A-7, A-373, and the new 36,000 minimum yield point, A36-60T, each providing special characteristics. In road and bridge building applications USS Structural Steels are the most economical of all load-bearing materials.

Progress Report on Alabama's new highway network

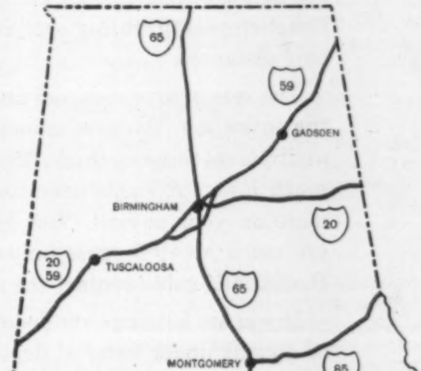
Alabama is moving ahead on an ambitious highway building program that will hook up with Interstate roads now under construction in neighboring states. The State of Alabama has 878 miles of new Interstate roads to build; 251 miles are already under construction and 24 out of 820 bridges are up. When completed, motorists will be able to travel north/south on four-lane freeways connecting Nashville with Mobile, Montgomery and Birmingham; and east/west from Atlanta and Chattanooga to Jackson. Travel time will be cut drastically but safety standards will be higher than ever due to fewer side road approaches and intersections.

Products from U. S. Steel play a major part in Alabama's ambitious undertaking. It will involve 120,000 tons of *structural steel*, 240,000 tons of *reinforcing steel*, and 75,000 tons of *steel piling*. Thousands of barrels of *cement* will be required for concrete paving and bridge piers. In addition, thousands of tons of *corrugated galvanized culvert sheets, slag* and varied hardware items of steel, all specifically engineered for long life and economy, will be needed and used to build this modern, safe highway network.

USS, "T-1", MAN-TEN, TRI-TEN, COR-TEN and DI-LOK are registered trademarks

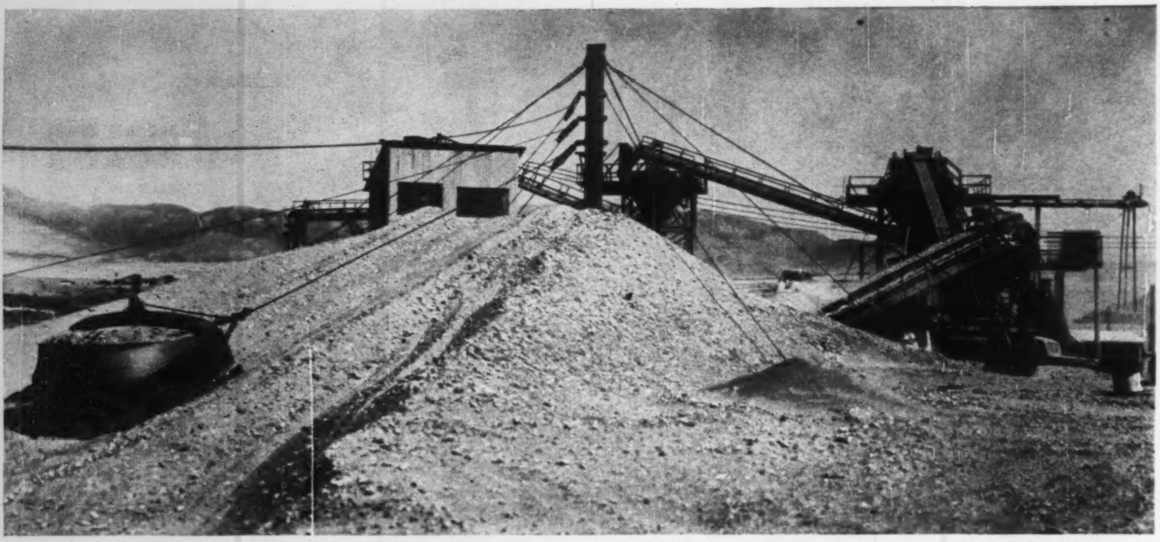
USS United States Steel

The highway market is served by the following divisions of United States Steel: American Bridge Division, Pittsburgh, Pa. • American Steel & Wire Division, Cleveland, Ohio • Columbia-Geneva Steel Division, San Francisco, Calif. • Consolidated Western Steel Division, Los Angeles, Calif. • National Tube Division, Pittsburgh, Pa. • Tennessee Coal & Iron Division, Fairfield, Ala. • Universal Atlas Cement Division, New York • United States Steel Supply Division, Steel Service Centers, Chicago, Illinois.



Write for the FREE 54-page booklet, "Keep Our Roads on the GO." You'll find all the United States Steel products and services that will help you cut costs and speed operations in highway construction. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

ONE TON FOR 6 CENTS...Total Digging and Hauling Cost with a Sauerman



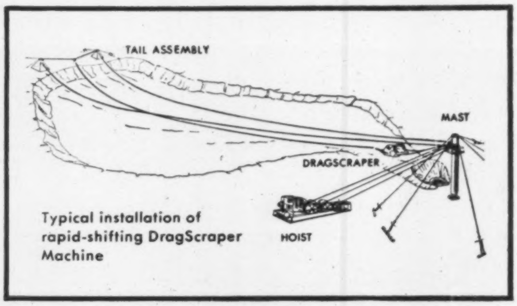
Dig and haul from your high bank, deep pit or underwater deposit direct to plant hopper or stockpile for 6 cents per ton. This cost is based on current job figures for Sauerman DragScrapers operating over average depth and haul distances.

The reason: one man and one machine handle the entire job. You save money three ways over multiple machine methods. Your power costs are much lower. A single operator replaces two or more on your payroll. Your maintenance costs are much lower because only the DragScraper Bucket and cable contact the material handled.

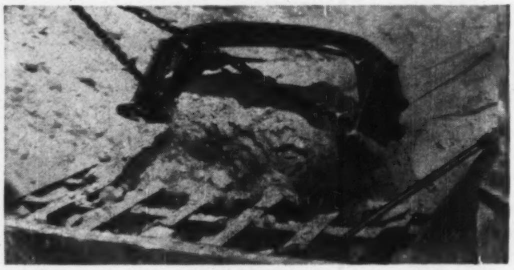
If you are hauling over distances up to 800 ft. or digging under water at depths to 100 ft.—the Sauerman DragScraper Machine is the most economical means you can use.

You can get DragScraper Machines in sizes from ⅓ to 15 yds. to match your tonnage requirements. Write or call about the physical dimensions of your deposit. We'll recommend the proper machine. For general information and detailed data on specific installations request Catalogs A and SG-1.

Plant Operators Are Saving On Power, Labor And Maintenance With Sauerman DragScraper Machines



Typical installation of rapid-shifting DragScraper Machine



DragScraper Bucket deposits load of sand onto grizzly hopper.

SAUERMAN BROS., INC.

632 So. 28th Ave., Bellwood, Illinois
LInden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

Publications

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Construction Equipment

Dredge

Illustrated four-page flier describes a dredge that features push-button control by one man, elevated control room, hydraulic drives on cutterhead and winches. American Marine and Machinery Co. **301**

Dredge

A two-page booklet tells how owning a dredge helped Suffolk County, N. Y. to complete 22 separate dredging projects in three years. Ellicott Machine Corp. **302**

Crane excavators

P & H crane excavators ranging in capacity from ½ yd to 70 ton capacity are pictured in a six-page folder. Harnischfeger Construction and Mining Div. **303**

Crane excavator

A 52-page catalog gives pictures, specifications, mounting details and job applications for a complete line of Lima crane excavators on crawler, truck and wagon mountings. Baldwin-Lima-Hamilton Corp. **304**

Crane excavator

Use of the Bantam Model C-350 on land and water conservation jobs is explained in eight-page Bulletin. Particular emphasis is on the wide-base under carriage of the crawler model which can straddle ditches up to 13 ft. wide. Schield-Bantam Co. **305**

Crane excavators

An eight-page catalog illustrates and describes the American 900 Series Crawler Crane-Excavator, a machine with a rated lifting capacity of 110 tons and a bucket capacity up to 4½ cu yds. American Hoist & Derrick Co. **306**

Crane hoist

The Hiab 170, a one-man operated crane hoist designed for truck mounting is pictured in its various uses in a four-page folder. Stancs Manufacturing & Sales, Inc. **307**

Truck crane

The carrier, machinery, controls and attachments of the Link-Belt Speeder HC-77 Zephyrcrane are described in a 20-page, two-color booklet. Link-Belt Speeder Corp. **308**

Paving machine

Bulletin lists features of the Suburban Paver, a machine with an eight-speed transmission and a four-ton folding hopper. Blaw-Knox Co. **309**

Asphalt finisher

Four-page, two-color folder gives specifications and dimensions of the Mark IV finisher. T. L. Smith Co. **310**

Scraper

Pictures, drawings and graphs give applications for the 430 hp B Tournapull which has a heap capacity of 58 cu yds when used as a tandem rig. LeTourneau-Westinghouse Co. **311**

Scraper

Specifications and construction details of LeTourneau-Westinghouse Speedpull, a 37 mph, 20 yd scraper in a 16-page booklet. LeTourneau-Westinghouse Co. **312**

Motor grader

A 12-page booklet shows specific uses and production records of Caterpillar's No. 14 Motor Grader. Caterpillar Tractor Co. **313**

Rollers

Five, two-page catalog sheets give characteristics and specifications for Essick tandem rollers of from 1- to 4-ton size. Also includes information on Model VR-28-R vibrating compactor. Essick Manufacturing Co. **314**

Minning equipment

Use of the Eimco 630 Crawler Series as a piece of all around mining and tunneling equipment is described and pictured in a 14-page booklet. Also illustrated are attachments. The Eimco Corp. **315**

Equipment line

The full line of Michigan construction and materials handling equipment is illustrated in a four-color, 32-page catalog. Included are nine models of tractor shovels, four models of tractor dozers, three models of tractor scrapers. Clark Equipment Co. **316**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Tractor

Structural details and uses of Caterpillar's two-wheeled 619B tractor are illustrated and described in twelve-page Bulletin. Caterpillar Tractor Co. **317**

Tractor shovel

Bulletin describes and illustrates six Michigan tractor shovels ranging in capacity from 4 to 6½ cu yds. Clark Equipment Co. **318**

Tractor loader

Design and engineering details of the 966—largest of Caterpillar's wheel Traxcavator line—are given in a 12-page booklet. Caterpillar Tractor Co. **319**

Tractor attachments

Four-page, two-color circular shows tine bucket, rake and cab for mounting on Michigan line of tractors. Rockland. **320**

Land clearing equipment

Fifteen different specialized attachments for Caterpillar track type tractors are described in a six-page folder. Fleco Corp. **321**

Core drilling rig

A rig that either cores down to depths of 4,500 ft or operates as a rotary drill to depths of 1,500 ft is described in six-page flier. Soiltest Inc. **322**

Drilling equipment

Twelve-page bulletin contains data and operating information on a complete line of crawler-mounted drilling equipment. Gardner-Denver Co. **323**

Backhoe loader

The special features and specifications of the new Dynahoe—a tractor with integral front-end loader and backhoe attachments—are listed in a four-page folder. The Hy-Dynamic Co. **324**

Backhoe

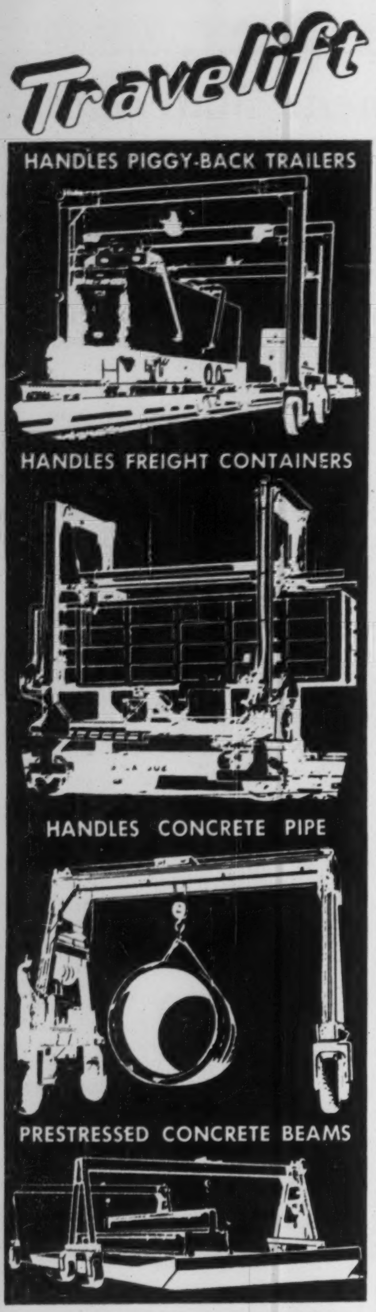
Bulletin shows Schield Bantam backhoe in use as truck, crawler and self-propelled models. Also includes specification list and list of attachments. Schield Bantam Co. **325**

Sweeping brushes

The advantages of Unisweep street sweeping brushes are described in a four-page folder. Roadmaster Brush Corp. **326**

Portable screen

Bulletin describes portable screens of 50 and 85-ton per hr capacity. Eastern Engineering Sales Co. **327**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Concrete spreaders

Two concrete spreaders, one a self-widening model, are described in bulletin and specification sheets. Chain Belt Co. **328**

Truck mixer

Ten truck mixers ranging in capacity from 4 to 7 cu yd and operated either by separate engine drives or by truck engine take-offs are described in an eight-page booklet. Whiteman Mfg. Co. **329**

Truck mixer

How the use of aluminum in truck mixer frames can permit an extra one-half yard of payload is explained in a six-page folder. Cook Bros. Equipment Co. **330**

Concrete guns

A six-page folder describes and illustrates a concrete gun with a capacity of 18 tons per hr. The machine is shown with three types of mounting for either truck carriage or a towed unit. Ridley & Co., Inc. **331**

Forming equipment

Standard and special concrete forming components described with photos, drawings and tables in a twelve-page folder. Simplex Industrial Forms, Inc. **332**

Concrete casting hardware

Eight-page bulletin describes metal inserts, anchors and other fastening accessories for precast and prestressed concrete. Superior Concrete Accessories, Inc. **333**

Electric vibrators

Compact vibrators for moving any material from fine powder to large crushed stone detailed in a four-page folder. Vibro-Plus Products, Inc. **334**

Concrete accessories

Bulletin illustrates and describes special accessories for precast and prestressed concrete work—hold-down anchors, threaded inserts and screw anchors. Superior Concrete Accessories, Inc. **335**

Masonry saws

Six-page flyer shows different blades and rotary saws for cutting masonry materials. Eveready Briksaw Co. **336**

Roofing equipment

A four-page brochure describes the operation and construction of a new centrifugal pump that can deliver up to 30 gph of hot material at a head of 110 ft. Hauck Manufacturing Co. **337**

Air tools

Stationary, portable and self-propelled compressors ranging in capacity from 75 cfm to 1,200 cfm are pictured and explained in a twelve-page booklet. Le Roi Div. Westinghouse Air Brake Co. **338**

Blind rivet fasteners

"Pop" fasteners, specially designed for one-side-only access fastening, described in a six-page folder. "Pop" Rivet Div., United Shoe Machinery Corp. **339**

Sandhog equipment

Man locks, muck locks, tunnel shields air locks and lock doors, grouters and pea shooter cars, and many types of tunnel cats and allied equipment are covered in four-page brochure. Mayo Tunnel and Mine Equipment. **340**

Torqueing gear

Third edition of the Torque Manual provides bolts charts, application guides and instructions for torque wrench testing. P. A. Sturtevant Co. **341**

Load indicators

Four-page, two-color folder gives specifications and installation details of weight indicators for boom cranes, bridge cranes and overhead hoists with capacities up to 500,000 lb. Martin-Decker Corp. **342**

Building Materials

Structural framing

Design manual describes the "Macomber V-Lok" system of structural framing in a 48-page booklet. Macomber, Incorporated. **343**

Tapered steel beams

Four-page folder details a new Slope Beam line of structural members designed for architectural adaptation. A36 steel beams come with one flat, one sloped flange in variety of sizes. R. G. Varner Steel Products, Inc. **344**

Nickel stainless steel

An extensive market survey and forecast of nickel stainless steel's future over the next seven years outlined in a six-page folder that describes 20 individual market studies. The International Nickel Co., Inc. **345**

Colored stainless steel

Information on application plus specifications, physical and mechanical properties of color coated stainless steel provided in an eight-page booklet. Washington Steel Corp. **346**

Centrifugally cast iron

Engineering properties of Meehanite Metal, Ni-Resist Iron, Ni-Resist Ductile Iron and Ductile Iron charted in an eight-page booklet. The Shenango Furnace Co. **347**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Heavy timber decking

Standards for heavy timber decking detailed with information on wood species, timber sizes, patterns, proper allowable unit stresses and other design data in a 28-page folder. American Institute of Timber Construction. **348**

Precast concrete

Four load-span data sheets cover precast concrete channel sections of 24-in. width, varying from 4-in. depth to 12 in. George Rackle & Sons Co. **349**

Concrete screens

"LaceStone" concrete screen wall designs are described in an eight-page leaflet. Soapstone Duct. **350**

Colored building panels

"Glasweld" permanently colored flat building panels detailed in a 16-page booklet providing application and specification information as well as case study installations. United States Plywood Corp. **351**

Sandwich panels

Clark Lite Panels, stressed skin sandwich panels constructed with rigid expanded polystyrene cores, are specificed in a six-page pamphlet. Clark Industries, Inc. **352**

Ceramic tile

Glazed and unglazed ceramic tiles, their specifications and their varied uses, are described in a 36-page booklet. American Olean Tile Co. **353**

Translucent panels

An eight-page booklet describes the San-pan translucent wall panel line for 1961. Panel Structures Inc. **354**

Plastic panels

An eight-page AIA file brochure contains complete technical data on the Filon line of glass and nylon reinforced plastic panels. Filon Plastics Corp. **355**

Polyester panels

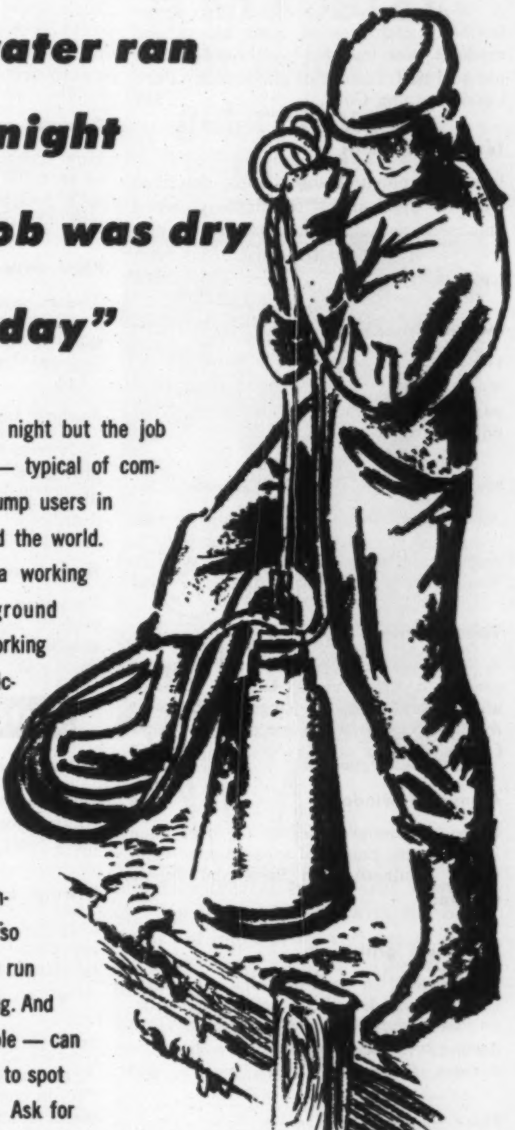
A four-page leaflet describes the roof and wall use of fire resistant, translucent panels made of polyester resin. Hooker Chemical Corp. **356**

Plastics

Cadco catalog tabulates prices for various plastic materials (e.g., nylon, vinyl, polyethylene) in sheets, tubes, rods, blocks and films. 64 pages. Cadillac Plastic and Chemical Co. **357**

Urethane foams

A 24-page brochure serves as a dual-purpose pictorial progress report and designer's fact file on industrial and commercial applications for urethane foams. Mobay Chemical Co. **358**



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Glass blocks

A 20-page catalog describes the design flexibility and uses of glass blocks and modules. Also included is technical data on physical performance of glass block. Pittsburgh Corning Corp. **359**

Textured coatings

Bostick, a polyurethane coating, described with its applications to masonry, wood and metal as an exterior seal and decorative coat or as an interior finish. BB Chemical Company. **360**

Masonry coating

Hydrocide Colorcoat for exterior or interior masonry finishing described in a six-page folder. Sonneborn Chemical and Refining Corp. **361**

Waterproofing

An exterior weatherproof coating for masonry, stucco, plaster or concrete walls is described in a four-page folder. Western Waterproofing Co., Inc. **362**

Vapor barrier

A four-page brochure about Ply-Bar, a ground contract vapor barrier, contains architectural tracer drawings together with recommended architect specification forms. Glas-Kraft, Inc. **363**

Aluminum windows

Ualco aluminum windows in more than 20 styles are presented in a 28-page catalogue. Southern Sash Sales and Supply Co., Inc. **364**

Aluminum grillework

"Grillewall", a non-modular aluminum grill material described in eight-page booklet with descriptions of its dovetail joint designed for simple erection without tie fixtures. Ceilings & Grilles, Inc. **365**

Floor topping

Specifications on the properties, mixing and placing a floor topping of synthetic anhydrite cement appear in a four-page bulletin. American Synthanite Corp. **366**

Chemical resistant floors

An eight-page catalog describes 30 Rulon corrision resistant materials and their applications. Ralph V. Rulon, Inc. **367**

Metal lath

Specifications for metal lathing and furring have been revised in a 20-page manual for 1961. Metal Lath Manufacturers Association. **368**

Industrial gratings

Specifications and descriptions of a new steel grating line are presented with emphasis on high-strength weld system in the new line. Dravo Corporation **369**

Ornamental metalwork

Scale drawings and lists of available patterns in ornamental ironwork intended to help in selection of trim and architectural metalwork. Julius Blum & Co. **370**

Concrete additive

How Pozzolith helped speed concreting of an 8,000 ft. railroad tunnel is explained in a four-page concrete performance report. Master Builders Co. **371**

Plant mixed asphalt

Twenty-page, two-color booklets describes six types of asphalt products produced by the Texaco Co. for road and airport construction. Texaco Inc. **372**

Asphalt surfacing

A 24-page booklet describes materials and procedures for surfacing roads with asphaltic materials applied by the pressure distributor method. Texaco Inc. **373**

Asphalt sealer

Two-page flyer explains how Para-Seal protects asphalt paving from damage by gasoline, oil, water, frost and sunlight. Paramount Industrial Products Co. **374**

Installed Equipment

Sewage treatment plant

Dimenisons, motor horsepower, design and construction of a factory-built sewage-treatment plant. Schmieg Industries, Inc. **375**

Sewage treatment plants

Factory-built plants for waste-treatment are discussed in flier that gives design tabulation for populations of 10 to 3,000. American Well Works. **376**

Sewage treatment plant

A packaged sewage-treatment plant, Bio-Pac, in capacities to serve 50 to 500 people is described. Link-Belt Co. **377**

Sludge treatment unit

A plunger pump and sludge processing unit is described in a 10-page paper. Marlow Pump Div. of Bell & Gossett Co. **378**

Sludge collector

A circular scraper sludge collector is described in detail in six-page flier. Chain Belt Co. **379**

Gas turbines

Economic advantage of the gas turbine plant is explained in nine-page booklet. Clark Bros. **380**

Diesel generators

Charts showing technical data on diesel generator sets for standby and continuous off the line power. Detroit Diesel Engine Div., General Motors. **381**

Steam generators

A line of automatic packaged steam generators ranging in size from 20 to 600 hp is treated in a 16-page illustrated booklet. Ames Iron Works, Inc. **382**

Steam condenser

A self-cleaning steam condenser is described in eight-page catalog. Wheeler Mfg. Co. **383**

Water storage tanks

Elevated steel tanks for water storage in capacities from 15,000 to 3 million gallons are described in a 20-page brochure. Chicago Bridge & Iron Co. **384**

Water tank

Illustrated eight-page bulletin about a toroidal elevated water tank, Aquatore. Graver Tank & Mfg. Co. **385**

Steel construction

A four-page brochure describes and illustrates some tanks, wind tunnels and other structures designed, fabricated and erected by Chicago Bridge & Iron Co. **386**

Equipment catalog

Air compressors, diesel parts, fluid and gas-pressure tanks, generating plants, etc., in the 64-page equipment catalog. Groban Supply Co. **387**

Air conditioning

A new line of packaged central station air conditioning units, is described in a 60-page bulletin. American Air Filter Co., Inc. **388**

Space heaters

Four-page folder catalogs space heaters, including specifications and capacities for units from 100,000 to 1-million Btu/hr. Stow Manufacturing Co. **389**

Electric damper controls

Electric damper controls are described in a six-page flyer. They provide thermostatic control for air-heating or cooling. New England Gear Works, Inc. **390**

Bucket elevators

A 22-page booklet on industrial bucket elevators for handling bulk materials contains engineer data on different models. Hewitt-Robins, Inc. **391**

Compressors

The Model 125 RP Rotary compressor, powered with diesel or gasoline engine, is described in a four-page bulletin. Davey Compressor Co. **392**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Blowers

Horizontal and vertical blowers and gas pumps are described and illustrated in a 12-page bulletin. Sutorbilt Corp. **393**

Vertical pumps

Basic design of Floway industrial pumps are illustrated in eight-page bulletin. Fiese & Firstenberger Mfg., Inc. **394**

Rotary pumps

Construction features, applications, general specifications and moutings for pumps of ½ gpm to 1,050 gpm are in an eight-page booklet. Viking Pump Co. **395**

Split case pumps

Vertical two-stage split case pumps in capacities to 1400 gpm and heads to 425 ft in one-page flier. The Aurora Pump Div., The New York Air Brake Co. **396**

Split case pumps

Horizontal split case pumps for water and clear liquid transfer are described in flier with cutaway illustrations. American Well Works. **397**

Volatile liquids pump

Cross-section drawings of standard short coupled vertical turbine pump and canned-type vertical turbine pumps in four-page brochure. Layne & Bowler Inc. **398**

Concrete pipe

A no-joint cast-in-place concrete pipe for waterways, irrigation and sewage disposal is discussed in six-page brochure. No-Joint Concrete Pipe Co. **399**

Steel pipe

Use of steel pipe on several major water-line construction projects described in eight-page journal. Steel Plate Fabricators Assoc., Inc. **400**

Steel tubing and pipe

Information on 15 steels widely used in high-temperature service for tubing and pipe. Babcock & Wilcox. **401**

Seamless piping

An eight-page bulletin tabulates dimensions and tolerances for installation of carbon, alloy steel and stainless steel pipe. Babcock and Wilcox. **402**

Coated steel pipe and tubing

Nickel-alloy-bonded steel pipe and tubing used to counter corrosion and iron contamination are described in eight-page booklet. M. L. Sheldon & Co., Inc. **403**

Clay pipe

Vitrified clap pipe catalog has 40 pages of specifications for extra strength, perforated, and double-length vitrified clay pipe. Evans Pipe Co. **404**

Clay sewer pipe

Vitrified clay sewer pipe and related clay products are treated in brochure that describes the evolution of sanitary sewerage. W. S. Dickey Clay Mfg. Co. **405**

Fire-lines pipe

Advantages of asbestos-cement pipe, Transite, its characteristics, specifications, and design data are given in eight-page booklet. Johns-Manville. **406**

Storm drains

Asbestos-cement storm water drainage systems are treated in ten-page brochure that gives cost comparisons. Johns-Manville Corp. **407**

Industrial vent pipe

Properties of Transite industrial vent pipe (formed of asbestos fiber, cement and silica) are given in a 20-page brochure. Johns-Manville Corp. **408**

Glass pipe

Catalog has 36 pages listing sizes of glass pipe from quarter-inch to six inch as well as fittings, flanges, joints, gaskets, etc. Fischer & Porter Co. **409**

Sluice gates

A 212-page catalog describes a line of water control equipment—sluice gates, valves, and miscellaneous equipment. Rodney Hunt Machine Co. **410**

Concrete pipe joints

Five gasket designs for joining sewage and drainage pipe in 15-page booklet. Hamilton Kent Manufacturing Co. **411**

Permanent cast couplings

Brochure describes line of cast couplings for all classes and sizes of cast iron or asbestos-cement pipe. Smith-Blair, Inc. **412**

Metal hose connectors

Illustrated catalog describes selection of flexible metal connectors for metal hose. Cobra Metal Hose. **413**

Welded fittings

Catalog gives 16-pages of specifications on a line of seamless carbon steel welding fittings. Dresser Manufacturing Div. **414**

Couplings

Twenty-page booklet lists uses and gives specifications and selection data for three types of Para-flex couplings. Dodge Mfg. Corp. **415**

Structural components

A 12-page bulletin illustrates and describes above ground and underground structural components such as tunnel liner plates, ring walers, anchor bolts, tie rods, roof supports, ribs and posts. Commercial Shearing & Stamping Co. **416**

"Call FOSTER for track ... get relayers PLUS"

Installing or maintaining sidings or other industrial track? Get Foster Quality Relaying Rail with the big "plus" of lower cost. And get all the necessary track accessories and tools to do the job.

You'll save on freight from Foster's nationwide warehouses, all of which stock all standard sections of new and relaying rail, plus *new* rail for crane runways and other special applications. You'll save too, using Foster Relaying Rail for safety barricades, reinforcing and heavy-duty structural uses.

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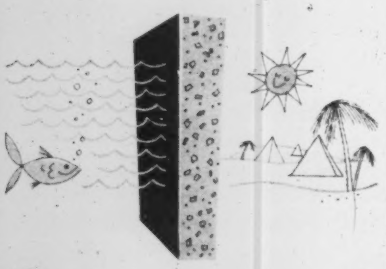

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Hinged closures

Hinged closures for blocking off the ends of pipelines, tanks or vessels are treated in detail in six-page leaflet. Tube Turns Div. Chemetron Corp. **417**

Valves and accessories

Catalog of line of iron-body bronze-mounted valves and accessories. American Valve Manufacturing Co. **418**

Waterhammer arrestors

Approach to sizing waterhammer arrestors for multiple fixture branches is given in eight-page brochure. Zurn Industries, Inc., Plumbing Products Div. **419**

Flow meters

Meters that use a vortex-velocity principle to measure flow of liquids and gases. Minneapolis-Honeywell Regulator Co. **420**

Membrane filter

Bibliography has 141 references on uses of membrane filter, some for detection of radioactivity in water, filtration of colloids, etc. Gelman Instrument Co. **421**

Solids classifier

A desanding and degritting unit, Dorr-Clone liquid cyclone classifier, in eight-page booklet. Dorr-Oliver Inc. **422**

Dust control equipment

Bulletin on four main types of dust control equipment—dry centrifugals, wet collectors, fabric collectors and electrostatic precipitators. American Air Filter Co., Inc. **423**

Dust-survey equipment

Equipment for dust surveys, air-pollution analysis, radiation protection and special sub-micron filtration apparatus are listed. Gelman Instrument Co. **424**

Nuclear gages

Booklet tells how to use nuclear gages for rapid field determination of moisture and density in soils, aggregates, concrete, asphalt, etc. Nuclear-Chicago Corp. **425**

Hoisting equipment

Catalog contains illustrations and tabulated specifications for a full line of electrically powered industrial hoists. Eight pages. Duff-Norton Co. **426**

Hoisting devices

Specifications and working loads for a line of chain slings, rings, links and hooks form the subject of a 16-page brochure. Jones & Laughlin Steel Corp. **427**

Revolving doors

A 20-page catalog on planning and installing revolving and swing door entrances. International Steel Co. **428**

Rolling door operator

Specifications of an electrically powered rolling door operator in an eight-page bulletin. Kinnear Manufacturing Co. **429**

Incinerators

Bulletin pictures incinerators designed to serve needs of dwellings, restaurants, schools, etc. and give data useful to the architect and engineer in selecting the proper unit. Morse Boulger, Inc. **430**

Dock leveler

Four-page folder describes the 4-Way dock leveler and provides specifications for models of up to 20,000 lb capacity. The Wayne Pump Co. **431**

Vibration control

Noise and shock control discussed in an eight-page folder describing steel spring, rubber and cork isolation assemblies plus flexible hose, acoustical materials and instruments. The Korfund Co., Inc. **432**

Methods

Water control

Benefits of planned water control practices on watersheds are outlined in eight-page booklet. Caterpillar Tractor Co. **433**

Dewatering system

A system of dewatering, stabilizing and preventing mass movement of wet soil during excavation is described in 60-page booklet. Moretrench Corp. **434**

Groundwater control

Groundwater control by a bentonite slurry trench method is treated in eight-page booklet. Cronese-Terminal. **435**

Sewage treatment

The Zimmerman process, that burns sewage sludge in its aqueous state, without flame, is explained. Zimmerman Process Div., Sterling Drug Inc. **436**

Microstraining

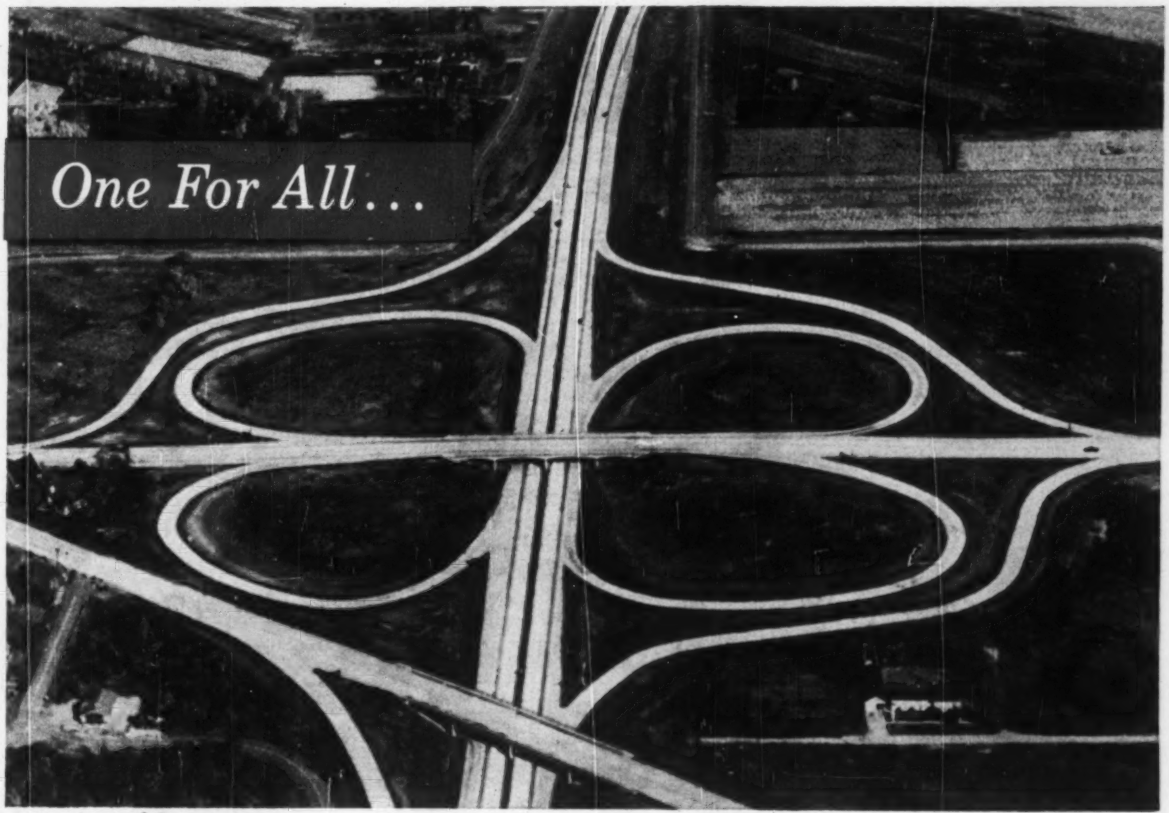
Microstraining installation at Marston Lake, Denver, Colo., is described in four-page brochure that tells the Denver water story. Glenfield & Kennedy, Inc. **437**

Right-of-way film

A 10-min film describes the proper procedure for planning and building a coordinated metropolitan transportation system. General Electric Co. **438**

Road stabilization

Bulletin explains how gravel, slag and stone can be made through stabilization into low-cost, low-maintenance roads by three stabilization techniques. American Marietta Co. **439**



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Two-component, jet-blast resistant, cold-applied for sealing sawed and formed joints. Meets Federal Spec. SS-S-170.

#357.1 HOT-POUR RUBBER-ASPHALT JOINT SEALER

Hot-pour type for concrete joints. Seals out water, foreign matter. Remains flexible over a wide field of service exposures. Meets Federal Spec. SS-S-164.

#357.9 HOT-POUR JFR JOINT SEALER

Specially designed to resist jet aircraft fuel. Meets Federal Spec. SS-S-167.

CD579.1 JOINT CURING TAPE

Concrete joint curing tape. Retains moisture in the concrete essential for curing joints. Protects freshly sawed or formed concrete joints against infiltration of foreign matter, cuts joint cleaning costs to a minimum.

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Non-extruding type of joint filler, fabricated from top-grade fibres, impregnated with waterproof asphalt.

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#340 KALKTITE® SEWER JOINT COMPOUND

Cold-applied, internal-setting asphalt cement. Produces watertight joint. Economical, resistant to roots and acids . . . Ready-mixed and hot-poured sewer joint compounds also included in this line.

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AMERICAN-MARIETTA COMPANY

A-M

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Road stabilization

Six-page folder explains how all-weather roads can be stabilized with salt. Procedure and equipment needed are explained and pictured. American-Marietta Co. **440**

Crusher

A 21-page manual discusses good and bad crushing practices aided by photographs of actual installations. Nordberg Manufacturing Co. **441**

Pile driving

Six-page bulletin gives features and operating details for McKiernan-Terry single-acting pile hammers. Explains underwater pile driving and includes a graph showing pile static load-bearing curves using the ENGINEERING NEWS formula. McKiernan-Terry Corp. **442**

Hard surfacing steel

Four-page data sheet explains in detail how Colmonoy alloys can be applied to surfaces which must be hardened. Alloy specifications and suggested uses are listed. Wall Colmonoy Corp. **443**

Power line rigging

Four booklets totaling 156 pages provide every design and rigging detail necessary for rural electric power line work. Rome Cable Div., Aluminum Co. of America. **444**

Electric heating

A 40-page brochure presents the various methods of heating by electricity and includes several recommended duct layouts. Lennox Industries Inc. **445**

Mineral wool insulation

"How To Install Mineral Wool Insulation In Homes," contains detailed instructions for installing batts and blankets and blowing wool. The 34-page booklet also explains the new "R" standard that tells a user exactly how and mineral wool product will perform after it is installed. National Mineral Wool Assoc. **446**

Insulating properties

A four-page reference chart for engineers in search of high-temperature insulation details the commonly-used plastic and ceramic insulating materials. Mycalex Corporation of America. **447**

Concrete masonry manual

From where to use and how to design through how to build and specify for masonry work covered in 17 sections over 48 pages. Expanded Shale Clay & Slate Institute. **448**

For More Information . . .

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Lead sound barriers

How and where to use lead as a sound absorbing barrier with specifications. Twelve pages. Lead Industries Assoc. **449**

Curing blanket

A four-page folder describes the use of plastic film as a concrete curing blanket. Visking Co. **450**

Incinerator selector

A slide-rule type guide helps find the type and size incinerator needed for various installations. Morse Boulger, Inc. **451**

Pump manual

Manual contains 24-pages of indexed material giving common-pump head terms, definitions, power required for pumping, theoretical horsepower required to pump water, etc. Marlow Pumps. **452**

Welding

Manual contains descriptions of latest techniques for welding, brazing, soldering, cutting and hardfacing of commercial metals. All-State Welding Alloys Co., Inc. **453**

Brazing

Four-page bulletin describes and illustrates methods of joining dissimilar metals. Handy & Harman. **454**

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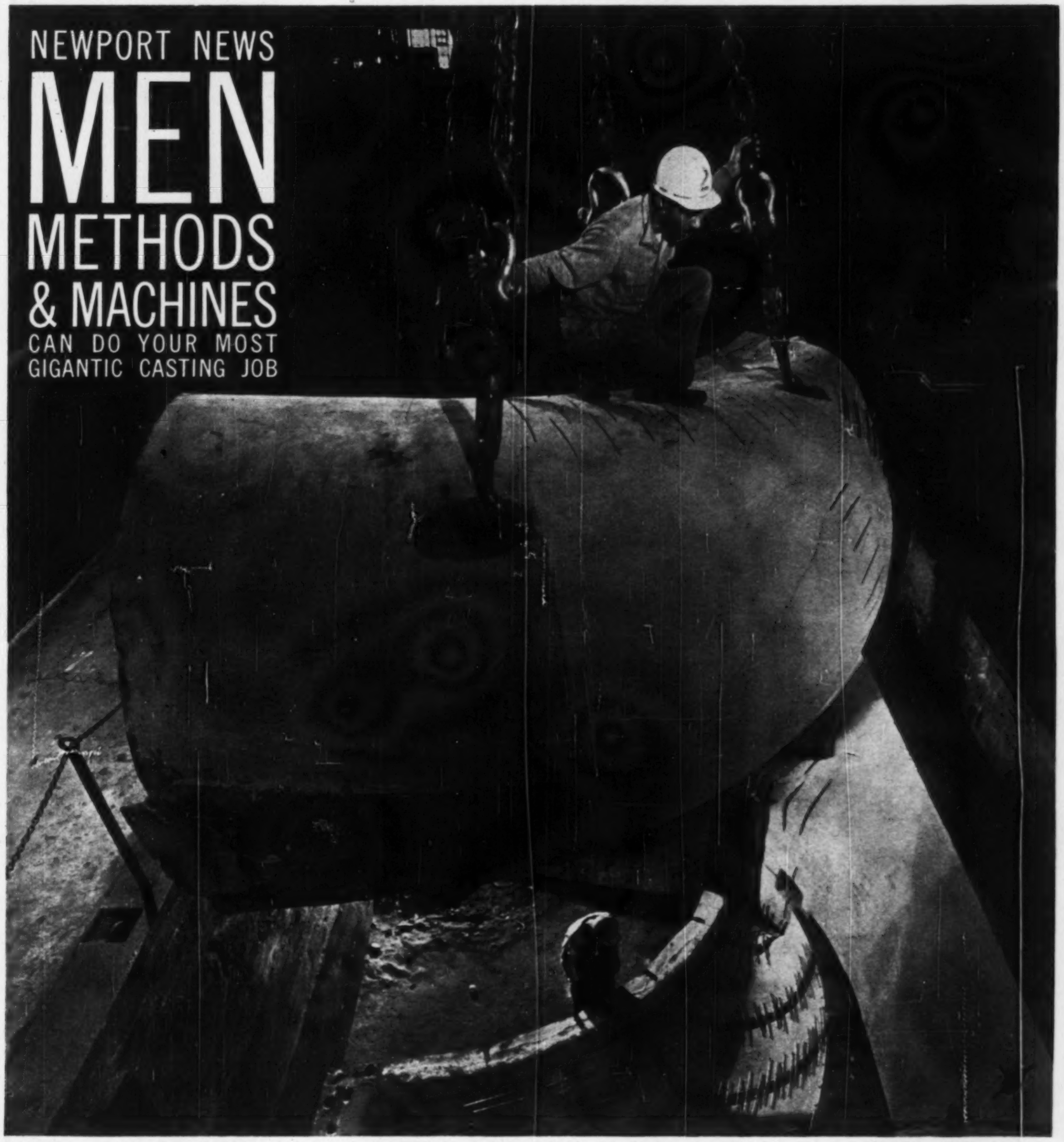

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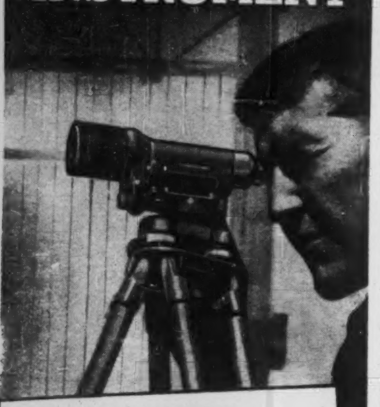

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Scale models

Industrial scale models with their application to planning manufacturing buildings discussed in an eight-page booklet. Knight Models, Incorporated. **455**

Hurricane shelter

An eight-side foldout pamphlet describes how a safety zone can be built into new or existing homes for protection against storms—and bombs. Plans and specifications for reinforced brick masonry as well as weather diagrams for area-frequency of storms included. Structural Clay Products Institute. **456**

Scaffolds

Bulletin illustrates the use of aluminum and steel scaffolding in providing elevated working platforms. Four pages. Patent Scaffolding Co., Inc. **457**

Film on jigging

"It's the Extra Jiggle that Counts"—a 16mm film—describes the theory and practice of one of the oldest forms of mineral benifaction and shows some new wrinkles added to the art. Wemco Div. of Western Machinery Co. **458**

Miscellaneous

Nuclear power plant

Results of start-up test program on the Dresden Nuclear Power Station are included in brochure illustrated with charts, diagrams and photographs of the plant. General Electric Co. **459**

Water promotion kit

A promotion kit to help promote adequate water facilities in your own community is available. Johns-Manville. **460**

Flocculation agent

A hydrated ferric sulfate, Ferri-Floc, for use as a coagulant in water-processing or sewage-treatment plants is described in four-page flier. Tennessee Corp. **461**

Pipe marker

Marker for preparing pipe to be cut before making a joint on headers, laterals, compound curves and flat surfaces is described in leaflet. Boyd Bros. & Sullivan. **462**

Diesel engines

Photographs and cut-away drawings in a 28-page colored booklet show structural details and applications of two-cycle Harnischfeger diesel engines. Specifications and list of accessories also included. P & H Diesel Engine Div. **463**

Safety regulations

Twelve-page booklet—punched for binding—summarizes contractor responsibility in providing safety devices, warning lights, barracades, signs, etc., in the various states. R. E. Dietz Co. **464**

Web slings

Six-page colored folder gives uses, specifications, characteristics and working capacities of nylon and dacron Safety-Weave slings, with capacities of from ¼ to 14 tons. Jones & Laughlin Steel Corp. **465**

Safety wear

A complete line of eye and face protecting devices—goggles, glasses, welders' helmets and masks—are described in a 40-page catalog. Mine Safety Appliances Co. **466**

Punch and binder

Fact Book explains how Combo punch & binder punches and binds records in a single operation. General Binding Corp. **467**

Traveling welder

"Squirtmobile" is the name of a trackless carriage for semi-automatic welding described in a four-page folder. The Lincoln Electric Co. **468**

Positioning equipment

Shop welding equiment described in a 16-page Guide to Positioning Equipment covering various machines, their capabilities, power and size. Ransome Company. **469**

Sound control

Twenty-page catalog gives materials, product data, general information on sound control systems as well as a full list of services and franchised contractors. Elof Hansson, Inc. **470**

Ladders

Information on "Gold Medal" ladders including step, single and extension models as well as accessories for trusses, scaffolds, plant and construction applications. Aluminum ladders treated in a separate section. Twenty-four pages. The Patent Scaffolding Co., Inc. **471**

Servo and wire products

A 24-page booklet outlines the diversified product lines of a company usually associated with only chain and cable. Products run from boat controls and lawn mowers to missile components and metering control systems. American Chain & Cable Co., Inc. **472**

Roller chain

Pictures, drawings and tables give details on Tuf-Flex roller chain for power drives on construction and industrial equipment. Diamond Chain Co. **473**

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508. **Canada's Biggest Earthfill Goes Year 'Round**—They proved some important points about cold-weather work on the South Saskatchewan River Dam.

509. **What's Right With the Interstate**—With the Blatnick committee making headlines again, you'll be needing this fact sheet in defense of the U. S.'s most important building job.

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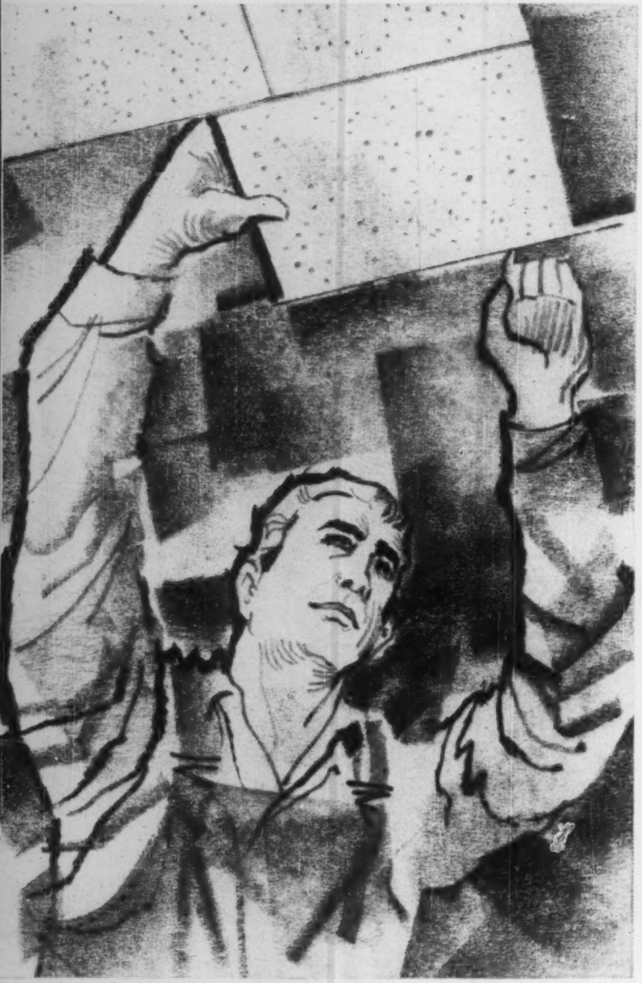

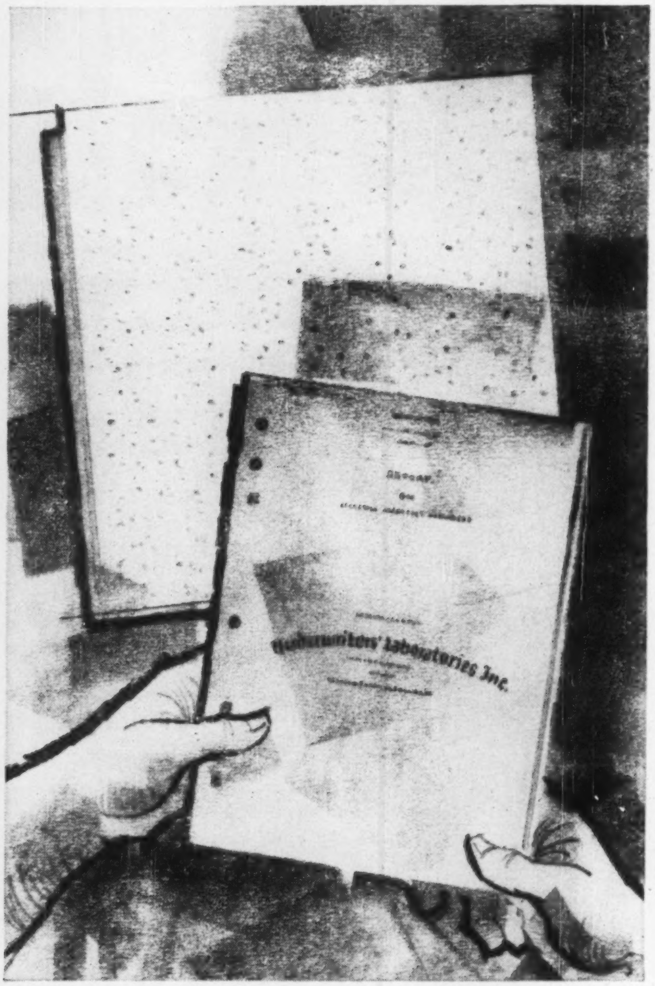
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CIRCLE 101 ON READER SERVICE CARD

Planners' key: High densities.

Letter from Hong Kong:

Building for Too Many

By Stanley Rich

I wonder if an ebullient Hong Kong Yorkshireman named James Ronald Firth caught that recent cartoon showing a witch doctor and two pith-helmeted explorers in Darkest Africa. One explorer, carrying a radio, is telling the other: "So I say to him, 'Inside box is magic voice.' And he says to me: 'Ugh, me know. Eight transistors.'"

If he did, it must have reminded him of a stuffy Washington day last April when he sat through a 20-minute film about an American-aided self-help scheme for cottages in Chile. When the film was over, his beaming host, an official of the National Association of Home Builders, remarked: "I don't suppose your natives have any idea of how to do this kind of building."

Though well meant, the remark couldn't have been farther from giving credit to Mr. Firth's work.

In a roughly 60,000-word official report on his attendance at the 1960 Congress of International Housing and Planning at San Juan (Washington was a stop-over), Mr. Firth brushed off the incident with a single sentence stating his host's "mistaken idea . . . was corrected." Just how he managed it, Mr. Firth alone knows. (For all his irrepressible enthusiasm, he is impeccably mannered English.) But there can be little doubt that by the time the embarrassing discussion was over, a red-faced NAHB official who thought he was Carrying The Word to Darkest Hong Kong felt as deflated as our cartoon explorer.

Mr. NAHB notwithstanding, Hong Kong's "natives," whoever they may be—the word is meaningless here and thus never used—are as far removed from the aided self-help stage as the bulldozer is from the pick and shovel. Since 1954, in fact, Hong Kong has been the scene of a daring low-cost housing experiment.

It is an experiment being watched with excited interest, enthusiasm and no little amazement by African and Asian planners whose own countries suffer from or are threatened by the same over-population problem that is strangling Hong Kong. Their amaze-

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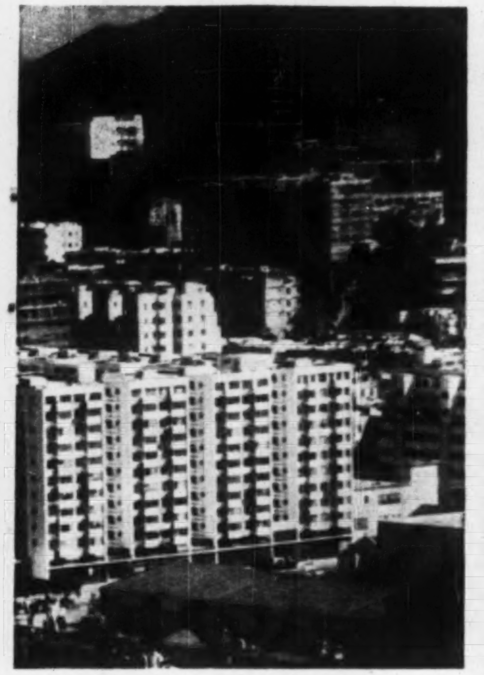
Stanley Rich, ENR's Hong Kong correspondent, writes from many years experience as a resident in that Far East city.



Apartments sprout with densities to 1,900 persons per acre.

People

ment stems from the fact that, for no apparent or logical reason, the darn thing seems to be working.

This is where the daring comes in. As late as 1955, leading English town planner Frederick Gibberd expressed what has long been accepted as a basic tenet of public housing. He wrote that housing density above 200 people per acre "is such that a human environment cannot be attained." Yet in the past six years and at the instigation of a far-sighted Colonial government, Hong Kong authorities, architects and engineers have blasted, bullied and bulldozed from this island's granite livable, low-cost housing with densities from 1,500 to 1,930 per acre.

Responsible for the Hong Kong experiment is a quasi-government body directed by Housing Commissioner J. M. Fraser and called the Hong Kong Housing Authority. As architect to the authority and acting housing commissioner, Mr. Firth (A.R.I.B.A., F.R.S.A., member of the American Society of Planning Officials and all that) is only part of its dedicated 125-man team. Its job: to provide permanent housing for the 33.4% of Hong Kong's swollen population earning between $50 and $150 per month. From the statistics alone, this would seem to be impossible.

Hong Kong's "problem of people" is surely the most intensive in Southeast Asia. You can take your pick on the figure. Government officially says 2.9 million, the generally accepted unofficial estimate is 3.2 million, while the private assessment of a number of experts is close to 4 million. Even then you have to add an estimated 153,000 per year: natural increase of 90,000, extra-legal immigration of 22,000 and illegal immigration of 42,000, mainly from Communist China.

Government since 1954 has spent $21 million to house 300,000 squatters. But some 325,000 residents still have no regular housing of any kind. Private builders in the past decade spent $243 million. But if all available accommodation was shared equally among the present population, everyone would still have less than the legal minimum of 35 sq ft. And Hong Kong would still need housing facilities for an additional 750,000 persons to achieve the recommended standard.

As for the "third of a colony" which the HKHA must not only house, but house in quarters suitable to become a permanent part of the urban complex, the majority still live in some 94,000, 15x30-ft tenement floors. Most are subdivided into cubicles and bedspaces of 40 or 50 sq ft each. The authority itself reports it is "not uncommon" for a family of four or more to live in a 24-sq-ft bedspace containing a bunk bed of sometimes three tiers.

Construction difficulties are also enormous. Of 29 square miles on the island proper (including several areas with population densities approaching 3,000 per square acre) and 369 on the Kowloon/New Territories tip of the China mainland, only about 60 square miles are available for building. Site formation and piling problems are formidable. Gradients are often steeper than 1 in 10. Cutting foundations and maneuvering construction equipment on these slopes is like changing cable cars in midspan. Because land near water is man-made, piles go to

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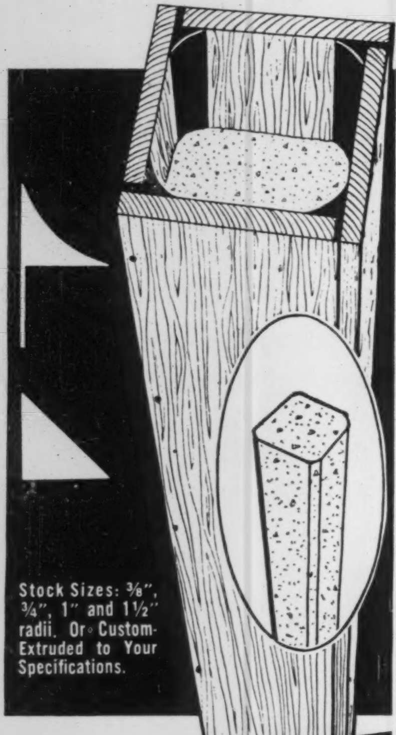
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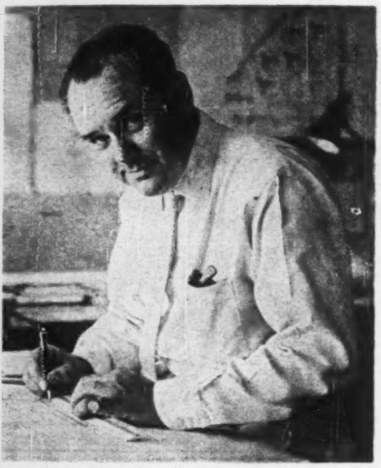


Hong Kong's Firth, "Build up."

rock, often to sea bed through filled ground.

Finally, there is the ever-present headache of financing. Established by Government Ordinance in 1954, the HKHA differs noticeably from low-cost housing agencies in the U.S. Rents, for example, are set between 15% and 19% of income (as against 25% in the States). The most basic difference, however, is that the authority is not subsidized and must be completely self-supporting. (Government apparently fears that, with the Colony currently going through an industrial revolution, subsidized housing would only encourage local industrialists to cut wages.) At the moment, the HKHA is operating on 40-year, 5% government loans, which must be amortized from the rentals received. But there are signs of tightening credit which, it is believed here, may force government to renege on its initial promise to the authority of unlimited loans.

And if that happens, the authority could be in trouble. Even if it found commercial loan sources willing to grant such favorable rates, there remains the fact that the 365½ square mile New Territories comprising the bulk of Hong Kong, is leased land that reverts to China not in 40 years but in 37.

Nevertheless, with a seam-bursting population leaving it no choice but to build, and with the scarcity of land leaving it no choice but to build vertically, the authority's record to date and plans for the future represent a pioneer effort in the original sense of that word.

Hong Kong planners fully recognize that vertical development is expensive and far from ideal. But the lack of land makes it their "only practicable solution." Up to now, authority construction has been traditional—reinforced concrete frames and floor slabs. (The reinforcing steel, incidentally, comes mostly from U.S. World War II aircraft carriers scrapped right in Hong Kong.)

Necessary economies have been achieved by an almost total elimination of finishings (plaster, floor coverings, trim, etc.). Extreme care is taken with form designs to avoid unesthetic bare patches. Space standards are drastically reduced to 35 sq ft per person, excluding kitchens and toilets, which are themselves very small.

Within the framework of Hong Kong's revolutionary Ultra-High Density Housing experiment, a second revolution is about to take place. Under constant pressure to cut costs, because of its self-supporting status, the HKHA will shortly attempt to introduce—for the first time in Hong Kong—prestressed concrete construction.

Some contractors appear unwilling to bid on prestressed concrete jobs because of the new equipment investment required.

But even if contractors can be brought to bid prestressed alternates, there will still be difficulties ahead. Administratively, the Government Building Authority has not yet approved prestressed construction for Hong Kong. Technologically, the newer construction techniques will run square against Hong Kong's existing building code.

Finally, there may be a social stumbling-block in that the adoption of the newer methods will throw many traditional construction workers out of their jobs.

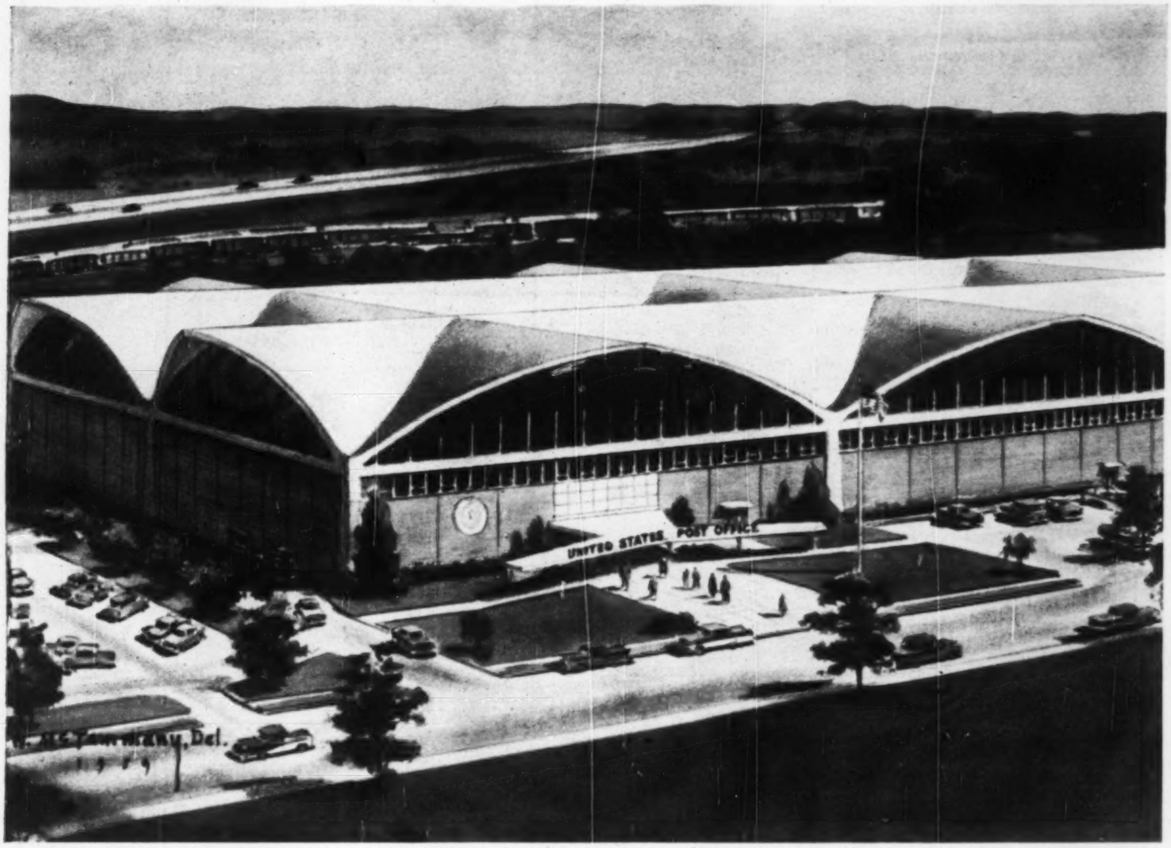
Hong Kong sits on the border of Red China, and government authorities are well aware that Communist agents and left-wing sympathizers here could just possibly seize on this as a ready-made political issue.

Still, the Hong Kong Housing Authority forges ahead. After six years and $28 million in construction costs alone, what they have learned is not only to their own advantage but also to that of all overcrowded Asia.

First, Hong Kong feels it has proved, tradition to the contrary, that people can live at ultra-high densities. Apparently it comes easier to the Chinese who is more gregarious than the American or the Englishman and less inclined to resent the intrusion of his many neighbors.

Second, assuming that new cost-cutting methods can be found, there seem to be no insuperable technical problems.

Asian housing experts are watching the Hong Kong experiment closely in hopes it will provide some of the answers to their own pressing problems.



Architect's sketch of new post office, Providence, Rhode Island. Architect-Engineer: Charles A. Maguire & Associates, Providence, Rhode Island.

First mechanized post office . . .

concrete domed shells provide 420′ x 300′ area with just two interior column groupings

A mechanized post office at Providence, R. I., is first step in a postal modernization program that will eventually provide "next-day" delivery anywhere in the U.S.

Six intersecting concrete shells form the multiple domed roof. Two four-column groups provide the only interior support. This permits unobstructed floor space essential to the electronically controlled mail-flow layout and allows the flexibility required for experimental spotting and rearrangement of machines. Another benefit of a shell roof was to eliminate exterior buttresses of conventional arch construction which would interfere with outside truck traffic.

A concrete weighing 110 lb. per cu. ft. with a 2-inch slump and seven-day strength of 4,000 psi was used. Aggregate consisted of sand in combination with expanded shale. An air-entraining agent was added.

For design data on barrel shells and on standard, skewed, groined and sloping hyperbolic paraboloids, write for free literature. (U.S. and Canada only.)

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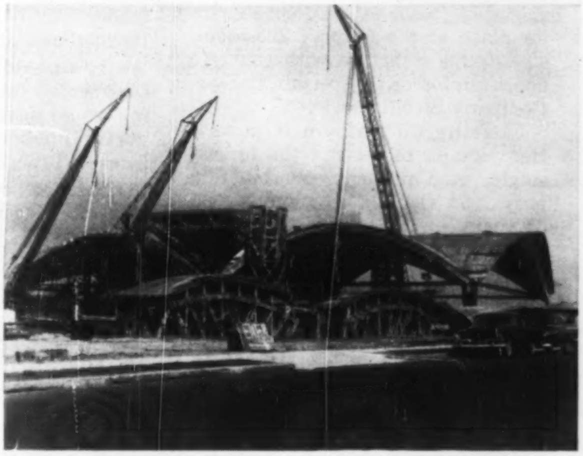

Falsework consisted of two identical sets of timber truss framing. 6″-thick shells each required 800 cu. yds. of concrete, placed in two operations. Spanning 150 x 140 ft., shells are separated by 2-in. expansion joints.

FOR STRUCTURES...
MODERN
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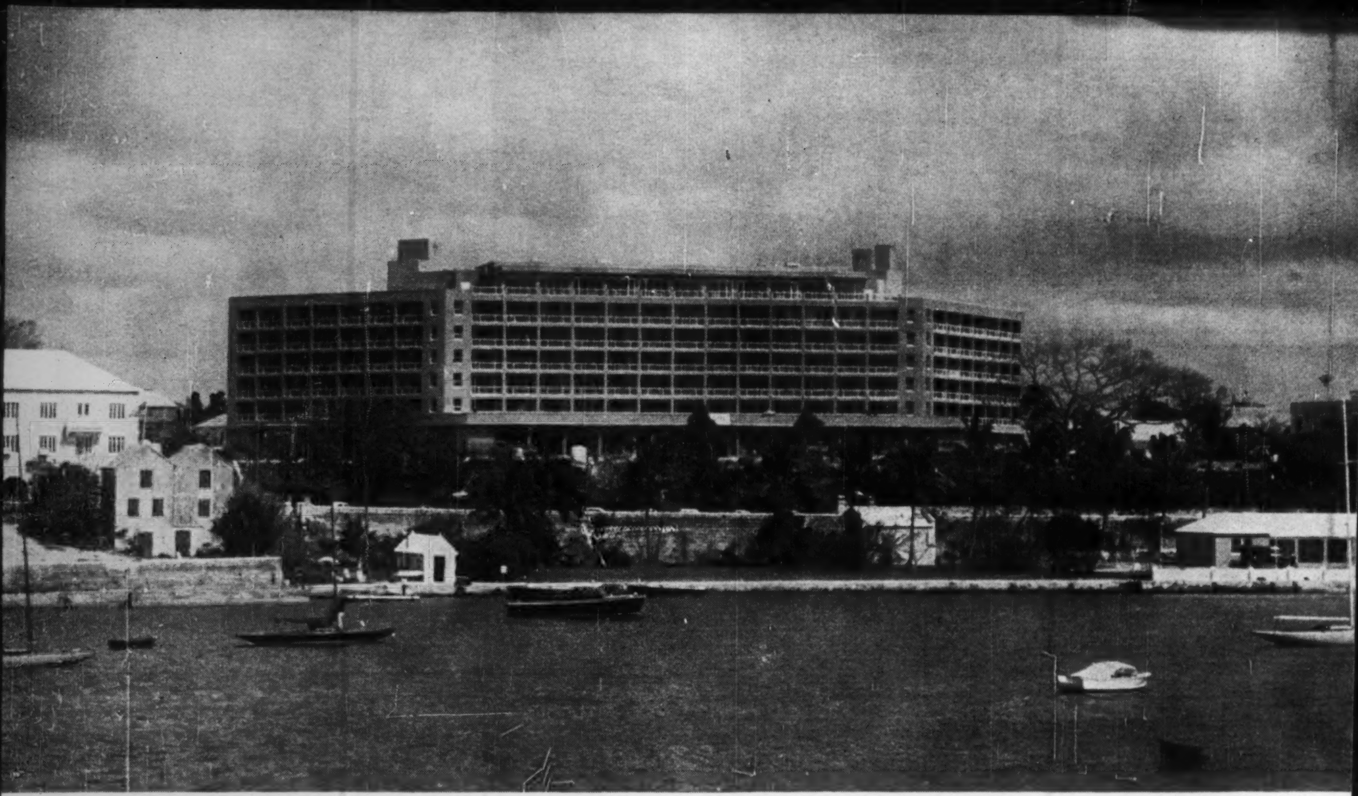


THE BERMUDIANA stands again as a majestic landmark dominating Hamilton Harbor in Bermuda. Steeltex by Pittsburgh Steel Co. went into the 280,000 square feet of concrete floors in the plush six-story hotel. E. G. M. Cape International, Ltd., was able to meet a tight construction schedule.

The Bermudiana Opened On Time— Steeltex Helped—Cut Costs, Too

Bermuda's beautiful Bermudiana Hotel again is dominating the majestic harbor at Hamilton.

Only the memory of the fire-ruined old Bermudiana remains. In its place is a six-story, 225-room, steel-frame structure with concrete floors reinforced by Pittsburgh Steel Company Steeltex.

Costing $5 million, the new Bermudiana represents the largest single, non-military, construction project in the island colony's past 31 years.

One of Canada's oldest and largest contractors—E. G. M. Cape International, Ltd.—built the new Bermudiana. It was a race with the calendar and a prolonged bout with the toughest kind of logistics on delivery of construction materials.

• **Contractor Won**—The Montreal-based contractor won and the Bermudiana welcomed its first guests just 14 months and 3 days after the contract was let for demolition of the charred ruins of the first Bermudiana.

Part of the credit for winning the race goes to Steeltex, the welded steel wire concrete reinforcement that carries its own waterproofed form on its back.

Steeltex was a natural for the Bermudiana job. Here's why:

• The island of Bermuda has no commercial lumber, so wood forming would have required costly, imported lumber. Steeltex combines form and reinforcing all in one.

• Steeltex saves labor. All skilled and experienced labor had to be brought in, mostly from Canada and mostly by air. In addition, the contractor had to set up a camp and service it.

• Steeltex' welded wire fabric is galvanized. On the Bermudiana job, this assures continuing protection of reinforcing against the corrosive elements of a tropical climate.

• But the big advantage was the speed of Steeltex installation. Cape Construction Superintendent Rhys Davies estimated wood forms would have required a crew of up to 60 men. The Steeltex installation required four men.

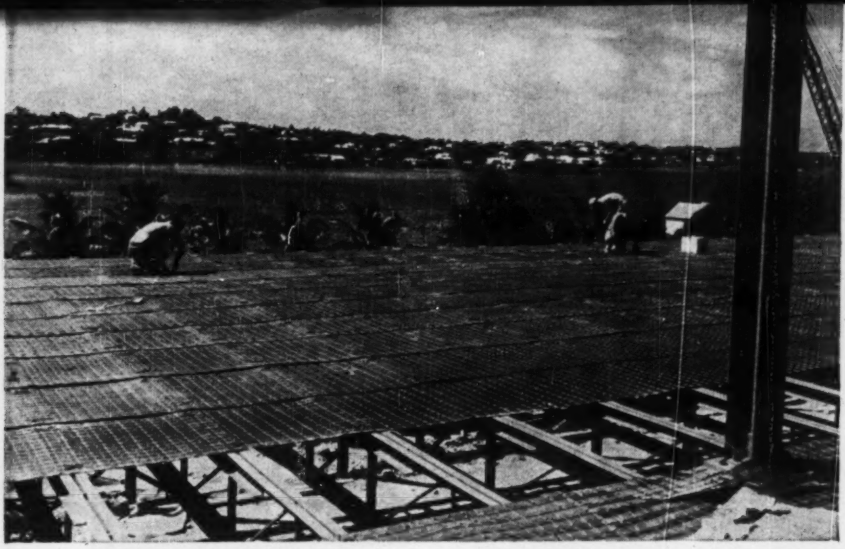
"Fifty percent of the cost at the site," Mr. Davies explained, "is labor. That's why we like a product such as Steeltex, which is preassembled and saves on-site labor costs."

• **Tourist Rush**—To get the full story of the new Bermudiana, you have to go back to a September afternoon, when a small fire broke out on the Bermudiana's fifth floor. It spread quickly and soon blazed out of control. Bermuda's greatest single disaster was in full progress.

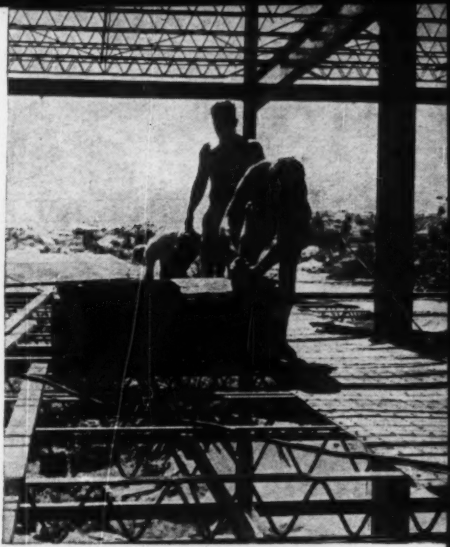
A major chunk of available hotel rooms was lost to the vital tourist industry.

Sir Harold Wernher, Bermudiana owner, announced his determination to re-build. Confronting him, however, was an immutable deadline imposed by rigid limits of Bermuda's tourist season. If the hotel couldn't be ready in time, it would be better to wait another year.

• **Big Obstacle: Time**—E. G. M. Cape was named as a single general contractor. Five days after getting the contract, Cape had its first crews on the scene.

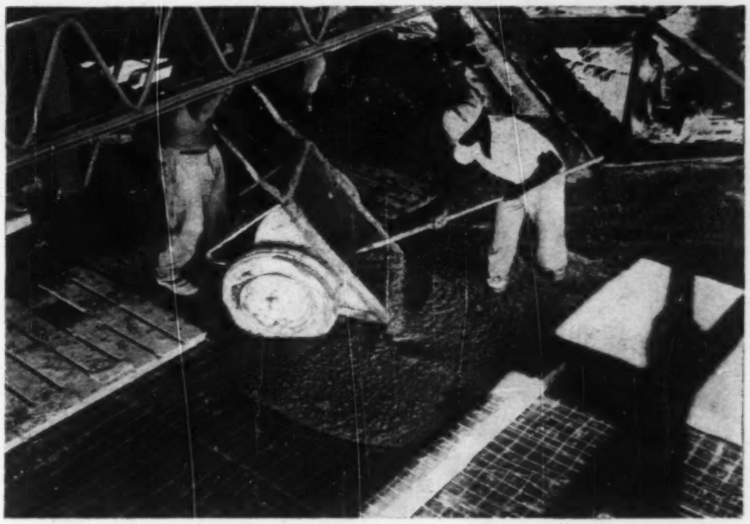


FOUR MEN laid Steeltex, which reinforced concrete in the Bermudiana's floors. Steeltex' galvanized fabric assures protection against corrosive elements of tropical climate. Above, crew is working on 60 by 200-foot floor for main dining room.



CONSTRUCTION WORKERS had to be flown into Bermuda, so saving labor was nearly as important as saving time. Here, a two-man crew unrolls the welded-wire Steeltex.

CONSTRUCTION SUPERINTENDENT Rhys Davies, above, said ease of installing Steeltex permitted concrete work to stay on schedule, one day behind structural steel erection crews.



STRONG, NEAT base of Steeltex gets its concrete. Waterproofed backing of Steeltex held moisture, permitting better curing of the slab. Labor costs of clean-up on floors below were eliminated.

All three factors influenced Cape's choice of a method to pour concrete floors. Pittsburgh Steel's Steeltex got the nod here for the 280,000 square feet of floors. Cape officials had been impressed with Steeltex on a number of building jobs in Canada, and liked Steeltex' economy and versatility.

Looking back, Construction Superintendent Davies said: "We could never have done this job within the time limits had it not been for Steeltex."

So if a tight construction schedule faces you, or if you want to cut labor costs, Steeltex will suit your needs.

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▶ **See Sweets Catalog Section 2-B**

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Field and Office

Infra-Red Paving Aid Required in New York

An infra-red heating device will have to hang on the side of asphalt pavers working on New York State highways.

The New York Department of Public Works now requires contractors to use a radiant heat unit during paving to create a level, well-knit joint between adjacent lanes and paving sections.

The infra-red process heats the edge of the asphalt pavement already in place to 225 to 275 deg so it will bond with the strip being laid. This eliminates the evidence of joint between the two strips and produces a smooth pavement.

The DPW insists on radiant heat, rather than direct flame, so that the pavement will not be oxidized.

A spokesman for the Department says only one company, Pavement Salvage, Inc., Pittsburgh, now produces an infra-red unit meeting specifications.

This unit uses propane gas (liquid petroleum gas) for fuel. It is 45 in. long and capable of handling paver speeds of at least 30 fpm. Two heaters installed in series have increased this speed to 100 fpm. The device hangs about ½ in. above the asphalt.

Automatic Camera Records Progress on Oahe Dam

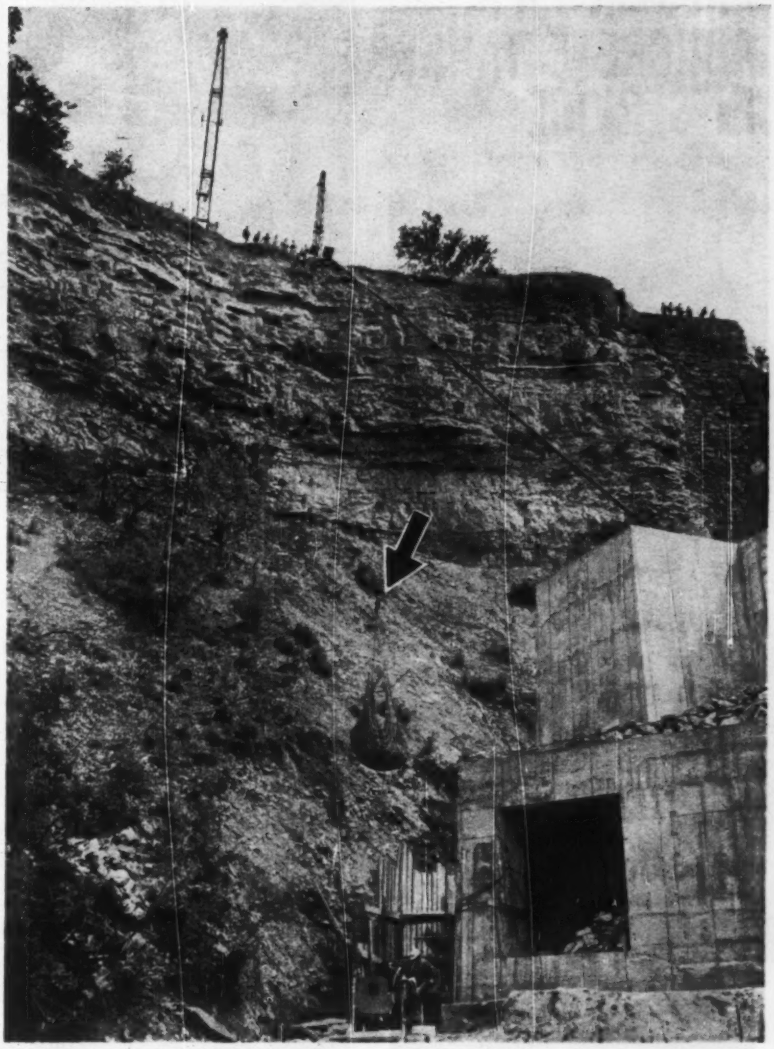
Add one more superlative when talking about Oahe Dam. The Missouri River project is now the most photographed, in addition to including the world's largest rolled earthfill.

The contractor is taking a half million pictures of his work under two contracts at the damsite to show step by step progress. Western-Knapp Engineering Co. of San Francisco will use the clips as a progress record, for promotional purposes, and possibly as a technical film for schools and the engineering and construction trades.

Every five minutes the camera automatically clicks. It's been doing this since April, 1960, and will continue—on a stepped up basis—until December 1, 1963. Construction of the dam's power intake superstructures, surge tanks and penstocks is getting the shutter treatment.

The camera sits in an elevated structure that commands a view of the entire project. It is a 16mm type, equipped with automatic aperture control and one-inch, 15mm wide-angle and two-inch telephoto lenses.

Oahe's 91 million cu yd is outranked in the family of fill-type structures only by Fort Peck, which is a 125-million-cu yd hydraulic fill (ENR Aug. 14, 1958, p. 21).



Rigged as an inclined trolley line . . .

Light Crane Does a Heavy Job

A subcontractor on the New York State Power Authority's $720-million Niagara Power Project came up with an ingenious way to make a small crane do the job of a big one.

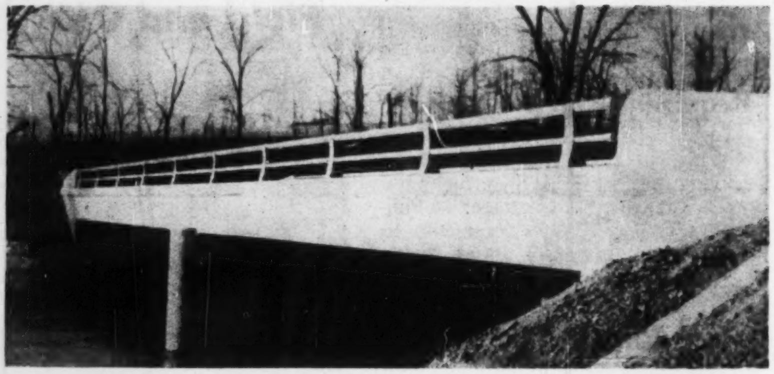
Construction of a 280-ft-high observation tower was complicated by the need to lower stone and fill 180 ft down to the bottom of the gorge at a 160-ft radius.

It looked like a job for a 150-ton crane with 200-ft boom operating at 200-ft radius.

But instead, Buffalo Structural Steel Co. did it with a 25-ton crane with a 50-ft boom. The crew rigged the crane's main load line as a trolley line to the pier at the gorge bottom where the fill was needed, then mounted a snatch block on the main load line and hooked the second drum line to the snatch block.

With the main line slack the operator could pick up a cargo net full of stone and swing it over the gorge. Then tightening the main load line and slacking off on the second drum line, he could let the load roll down to the bottom of the gorge.

To unload, one side of the cargo net was unhooked. Then the empty net was drawn back up for refill.



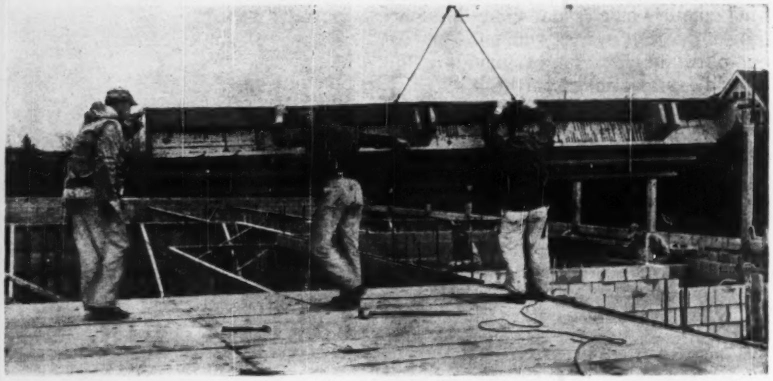
Counties Build Prestressed Bridges

County engineers are making increased use of prestressed concrete for replacement of outmoded bridges and for new structures.

Franklin County, Pa., recently took alternate bids for a small bridge with prestressed box beam, prestressed composite I-beam, and composite steel designs. The prestressed concrete box beam design resulted in the low bid; the structure (above) was completed at a cost of $10.73 per sq ft. Designs were by consulting engineers Frederic A. Nassaux & Associates, Chambersburg, Pa. New Enterprise Stone & Lime Co., Roaring Springs, Pa., supplied the prestressed box beams.

Harvey County, Kan., built a prestressed box beam bridge with composite design; the structure is 255 ft long, with two outside spans of 49 ft and three interior spans of 51 ft. The designer—Wichita consulting engineer R. S. Delamater—placed mild steel reinforcing in the deck over the piers to make the structure continuous for live load. The box beams rest on neoprene bearing pads. The piers are prestressed concrete pile bents. The bridge was built in 36 working days at a cost of $8.08 per sq ft.

Other counties have built bridges utilizing single tee prestressed concrete sections. A bridge of this type in Eugene, Ore., with a 70-ft span, cost $6.73 per sq ft.



Prefab Panels Cut Erection Time

Factory-built plywood floor and roof panels cut 45 days off the construction time on a four-story office building in Seattle.

Prefabrication also saved materials through tee-beam action achieved by gluing plywood decking to the joists. Conventional floor joist framing would have required 3 x 12's to furnish equivalent bending strength provided by the built-up sections of $\frac{5}{8}$-in. plywood and 2 x 12 joists in the typical floor framing. Roof framing consists of $\frac{3}{8}$-in. plywood and 2 x 6's spaced 12 in. c-c.

Three standard plywood sheets, 4 x 8 ft, form each prefabricated panel, which measures 4 ft x 24 ft in plan. They are supported on laminated timber beams and columns.

Panelbild Systems, Inc. of Lynnwood, Wash., fabricated the panels and trucked them to the nearby site. A six-man crew and one truck crane erected each 10,000-sq-ft floor in two days.

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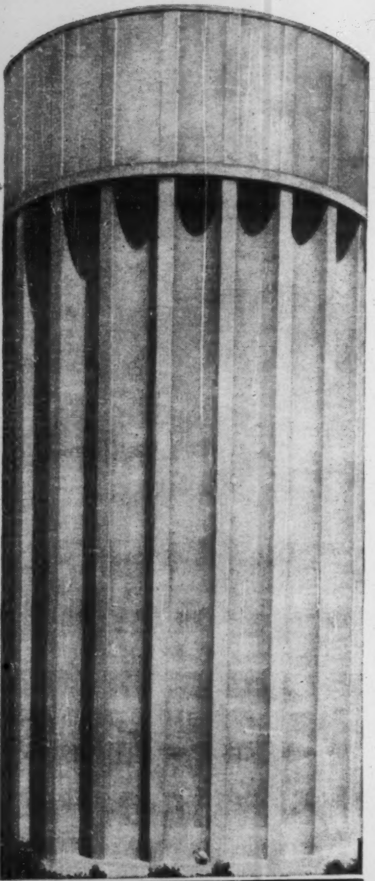

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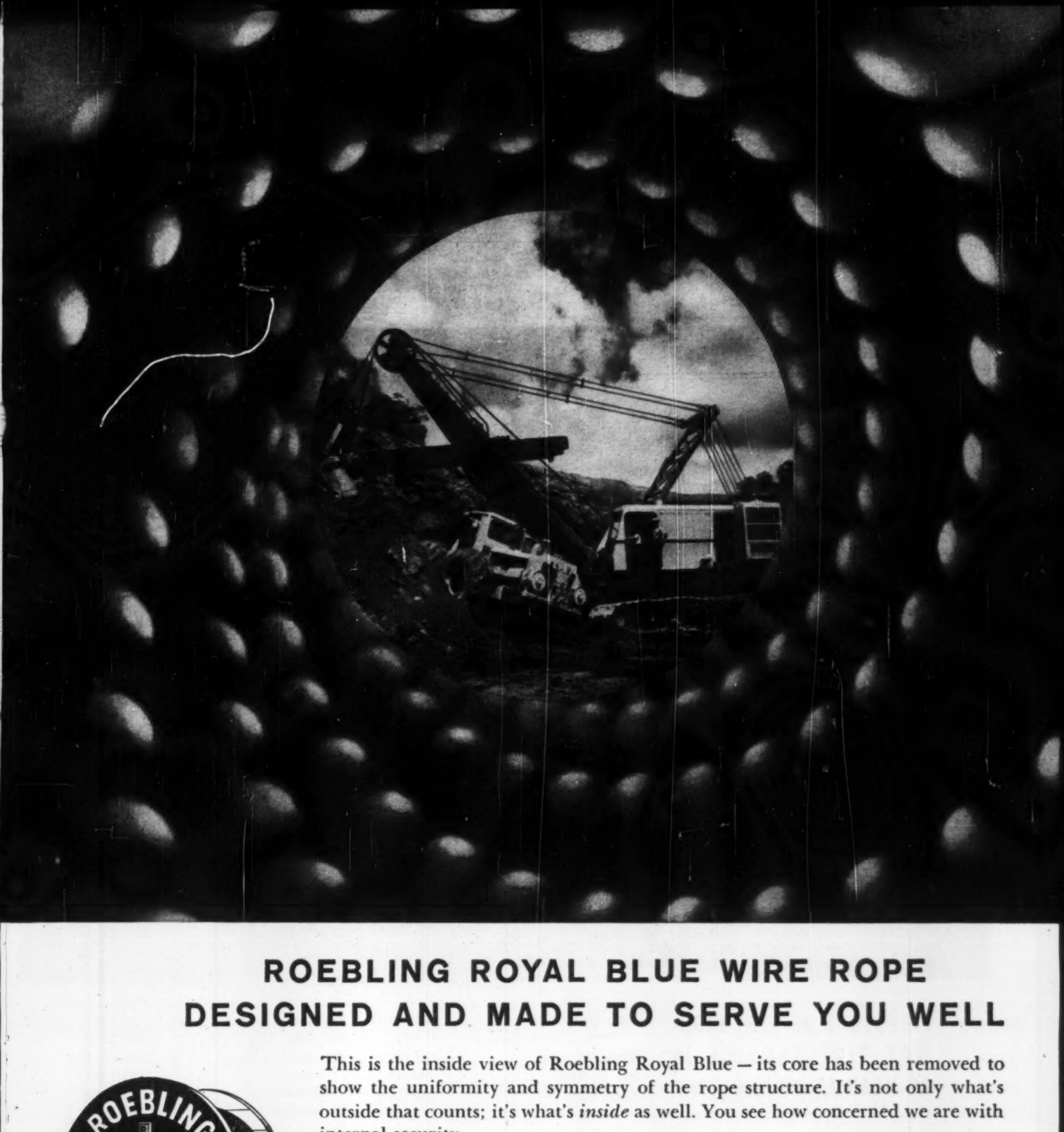

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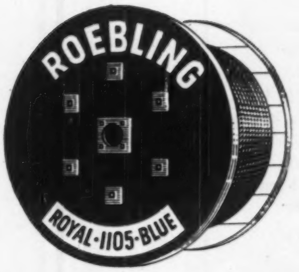

This is the inside view of Roebling Royal Blue – its core has been removed to show the uniformity and symmetry of the rope structure. It's not only what's outside that counts; it's what's *inside* as well. You see how concerned we are with internal security.

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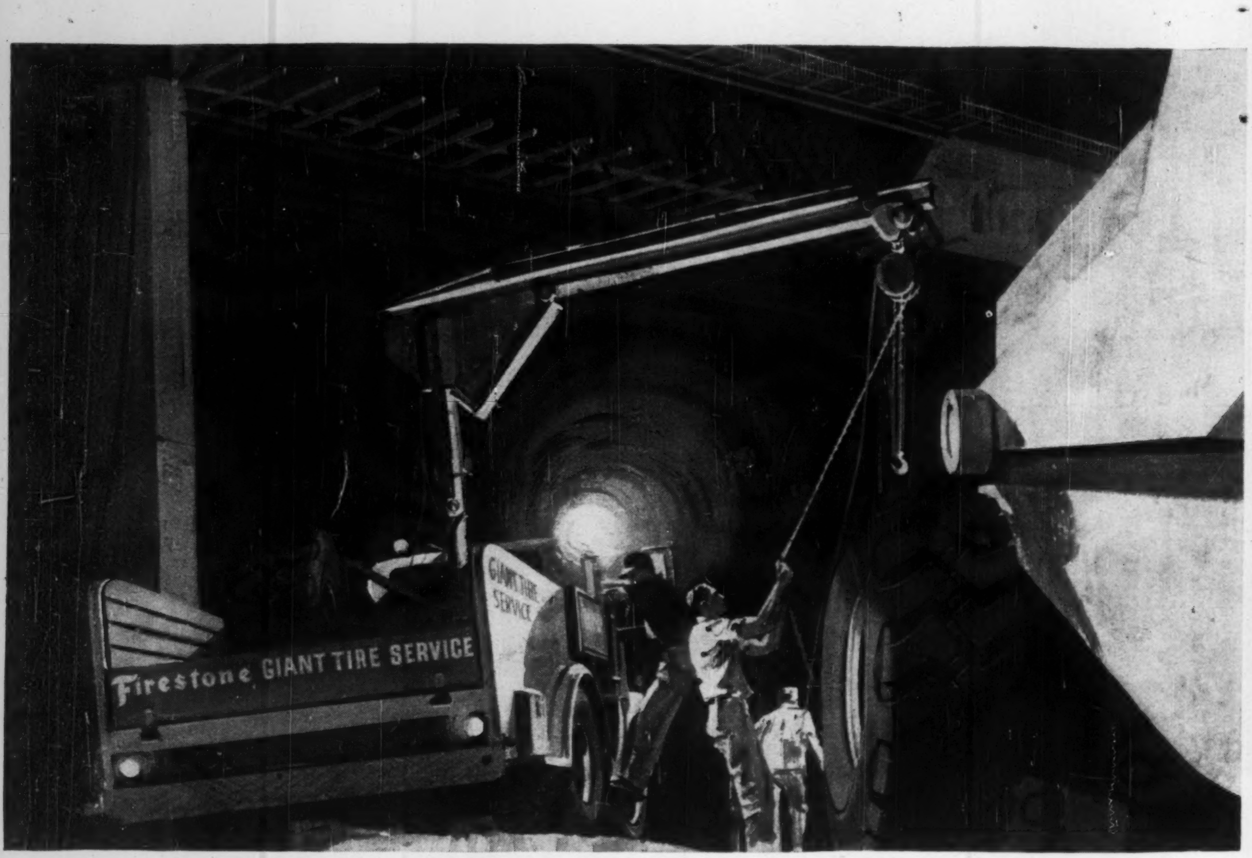

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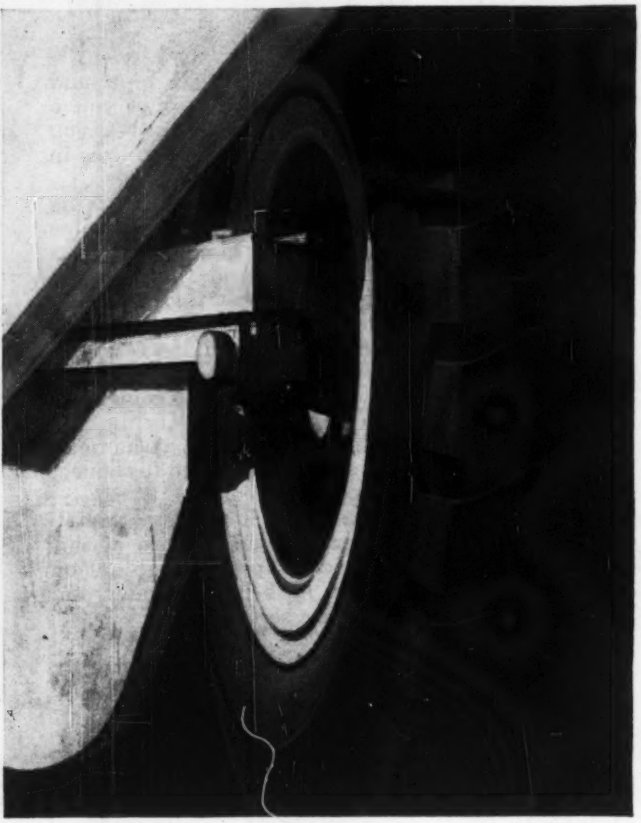

NIGHT & DAY

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Bridge Girders Spliced To Span a Warehouse

Steel workers and crane operators borrowed the delicate touch of a watchmaker to erect a span of Allegheny County's 62nd Street Bridge over the roof of a warehouse.

Workers of United States Steel's American Bridge Division spliced four giant girders in the air to bridge the building on the south bank of the Allegheny River. After splicing, each girder is 180 ft long and weighs 72 tons.

Shipped to the site as individual units because of their size, the girder halves were joined with the aid of two cranes —a 60-ton-capacity traveler operating on top of a section of bridge steelwork already in place and a 60-ton-capacity crawler-mounted crane on the ground. As the cranes held the girder sections steady a few feet above the roof of the warehouse, workers bolted the two parts together to make a temporary connection. Permanent connections were made by riveting.

The new bridge will replace a two-lane, 60-year-old structure and connect Butler Street in the Lawrenceville section of Pittsburgh with the Etna Bypass of the Allegheny River Expressway across the river in Sharpsburg. It will carry four lanes of vehicular traffic on two 25-ft-wide separated roadways.

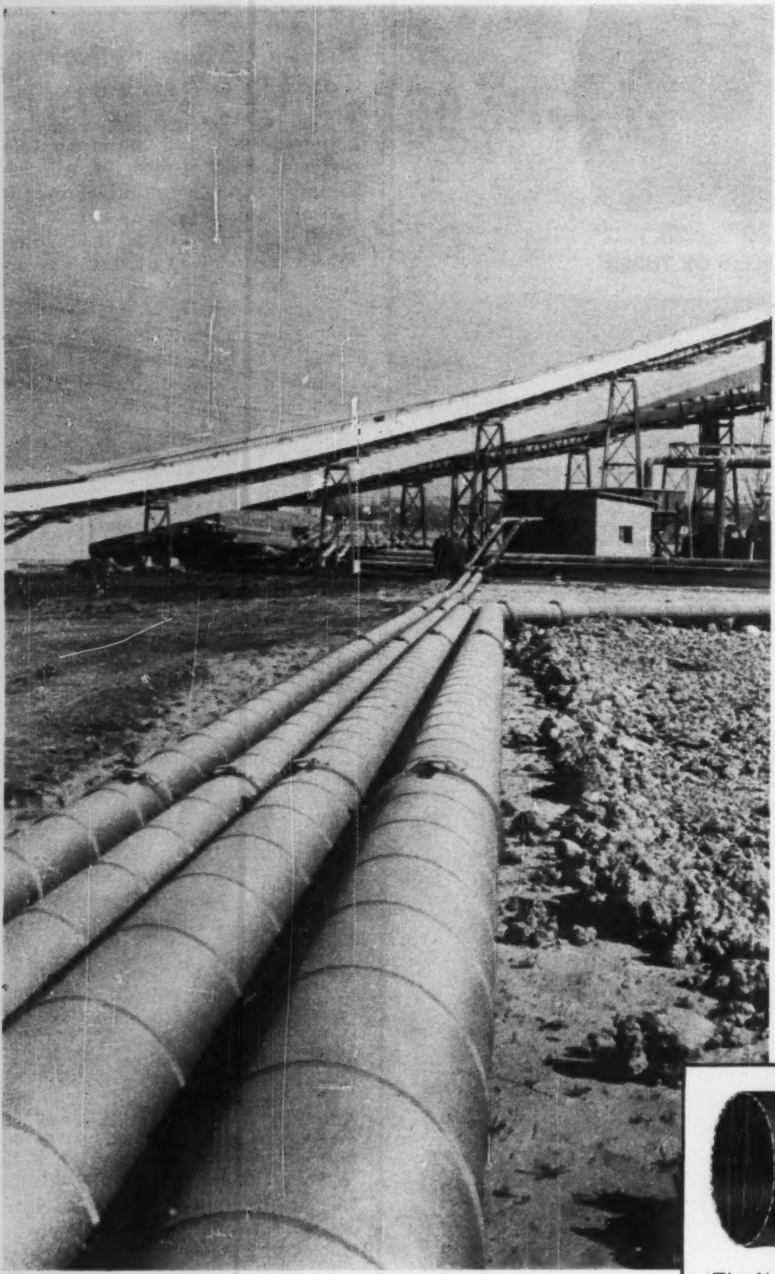
The bridge is 2,100 ft long, including 850 ft between river banks. From Butler Street to Sharpsburg, it comprises three cantilever deck plate girder spans, one simple deck plate girder span, three cantilever deck truss spans across the river, one simple deck truss span, and eight simple deck beam spans. The deck truss spans are 35 ft deep, clearing the river by about 50 ft.

The structure is being built by Allegheny County under the supervision of Levi Bird Duff, Director of Public Works. Design is by New York City consultant Parsons, Brinckerhoff, Quade and Douglas.

Concrete Mixed in Pavers Instead of Tilting Mixer

Two contractors, DeSalvo Construction Co. and S. A. Ruebel Co., joint venturers on a 6.5-mile Interstate Highway paving job near Cincinnati, have come up with a novel idea in central mix concrete plants.

Batching plant and materials handling are conventional, but the concrete is mixed in two 34-E dual-drum pavers instead of a conventional stationary tilting mixer. Mixing time is 1¼ minutes. The $4.8-million contract includes 67,800 cu yd of portland cement concrete.



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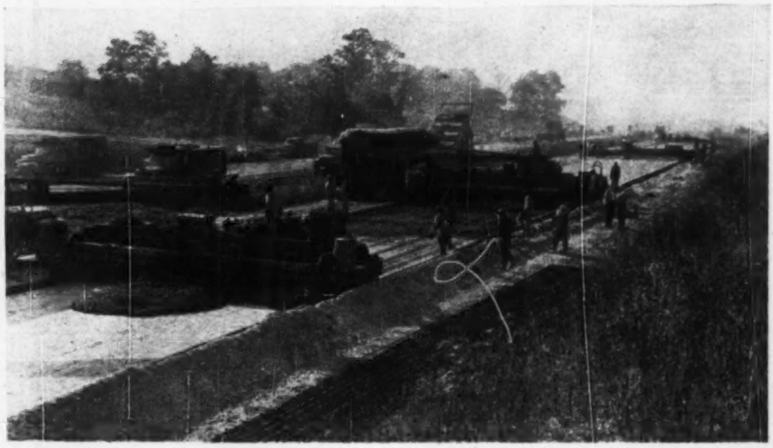


Workmen place bar mats for continuously reinforced pavement.

No-Joint Concrete Paves Way

A large portion of the pavement on a 6½-mile stretch of the Baltimore-Harrisburg Expressway (Interstate 83) will be continuously reinforced concrete.

The section under construction lies adjacent to Cockeysville, Md., and includes 84,200 sq yd of the unusual pavement. When the segment is completed, motorists will be able to travel from the Baltimore Beltway to Chicago on dual lane roads without a stoplight.

The contractor, C. J. Langenfelder and son, Inc., is laying the 25-ft-wide roadway as an 8-in. slab continuously reinforced with deformed bar mats. The steel percentage is constant at approximately 0.6% of the concrete cross-sectional area. The mats are made at Bethlehem Steel Co.'s reinforcing bar shop in Baltimore.

There will be 23,200 sq yd of conventional pavement placed in the 6½-mile stretch. This section, however, will be 9-in. thick because it contains less steel. All conventional pavement will be laid adjacent to the five bridges already in place. Ramp paving will be reinforced by welded wire fabric.

The section of continuously reinforced pavement lacks the unusual expansion and contraction joints. The deformed bar mats, up to 2½ times as heavy as normal, hold the pavement together even during wide temperature changes. Numerous transverse hairline cracks develop in a controlled, predictable pattern. The cracks are so narrow that their existence is hardly noticeable; dirt and water cannot enter them in large amounts; and the motorist is completely unaware of them.

Meanwhile, on a Pennsylvania road built in 1957, a 0.38-mile section of experimental pavement that is continuously reinforced will be replaced with conventional concrete.

Experts thus far have been unable to isolate the cause of failure of one section of U. S. Route 22, near Hamburg. Three thicknesses of concrete were used on the experimental segment —seven eight and nine inches thick. Replacement has only been necessary on the 7-in. portion of the eastbound lane. The westbound lane, which also has 7-in. pavement, has not failed.

A similar experimental section on U. S. Route 111 near York, Pa., was installed for about two miles in the fall of 1956 with a 9-in. pavement and 6-in. subgrade. This section has not shown any sign of failure.

Pulp Mill Sulfite Wastes Could Cut Steel Costs

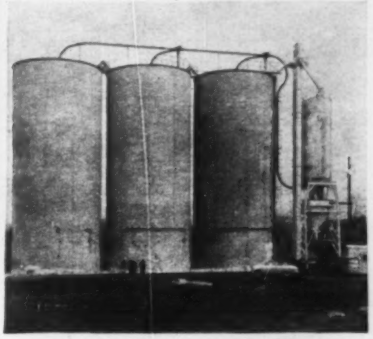
Sulfite waste, a major stream pollutant in the U. S. and other paper-producing countries, is showing promise as a cost-saving aid in processing low-grade iron ores.

Studies under way at the Michigan College of Mining and Technology on low-grade ores from the Lake Superior region have been encouraging enough to draw the support of the Sulfite Pulp Manufacturers Research League. The industrial group has contributed $8,000 to further the research.

The major goal is to find out how to use the sulfite materials in pelletizing iron-ore concentrates instead of the costly high-temperature hardening now required to prepare low-grade ores for shipment to blast furnaces. Secondary advantages are also considered probable.

(*Research continued p.* 118)

MARIETTA
terminal storage system helps Pittsburgh Coke and Chemical build sales...



cuts Green Bag Cement Division shipping costs and delivery

Pittsburgh Coke and Chemical's Green Bag Cement Division, needing on-the-spot cement storage for Ohio's booming construction market, turned to Marietta for a solution. The result: a custom-tailored, three-silo terminal storage installation, with 25,000 barrel capacity, located near Marietta, Ohio, to take advantage of economical river transportation. Cement is shipped by barge direct from Green Bag's Neville Island (Pittsburgh) Plant to their new facility; self-contained pneumatic unloading equipment connects to silo piping system to speed discharging and eliminate the need for expensive equipment at each site. The silos gravity feed into a screw conveyor for quick delivery to surge bin and drive-under truck loading.

Green Bag Cement's terminal storage system is typical of how Marietta engineers solve specific industrial storage problems. If you want efficient bulk storage, write today for an engineered solution that will save you time, money and materials for many years . . . ask for our Industrial Storage System Booklet.

Only Marietta makes four types of concrete staves . . . to insure the right one for every installation.

Marietta CONCRETE DIVISION
AMERICAN-MARIETTA COMPANY
Marietta, Ohio
Representatives in principal cities
PRECAST CONCRETE PRODUCTS FOR INDUSTRY, FARM, HOME

CIRCLE 115 ON READER SERVICE CARD

In $27-million project, trucks pounded test pavements night and day for two years

1.1 million load applications in the official

Sponsored by the American Association of State Highway Officials (AASHO), this great test will influence pavement design for years to come.

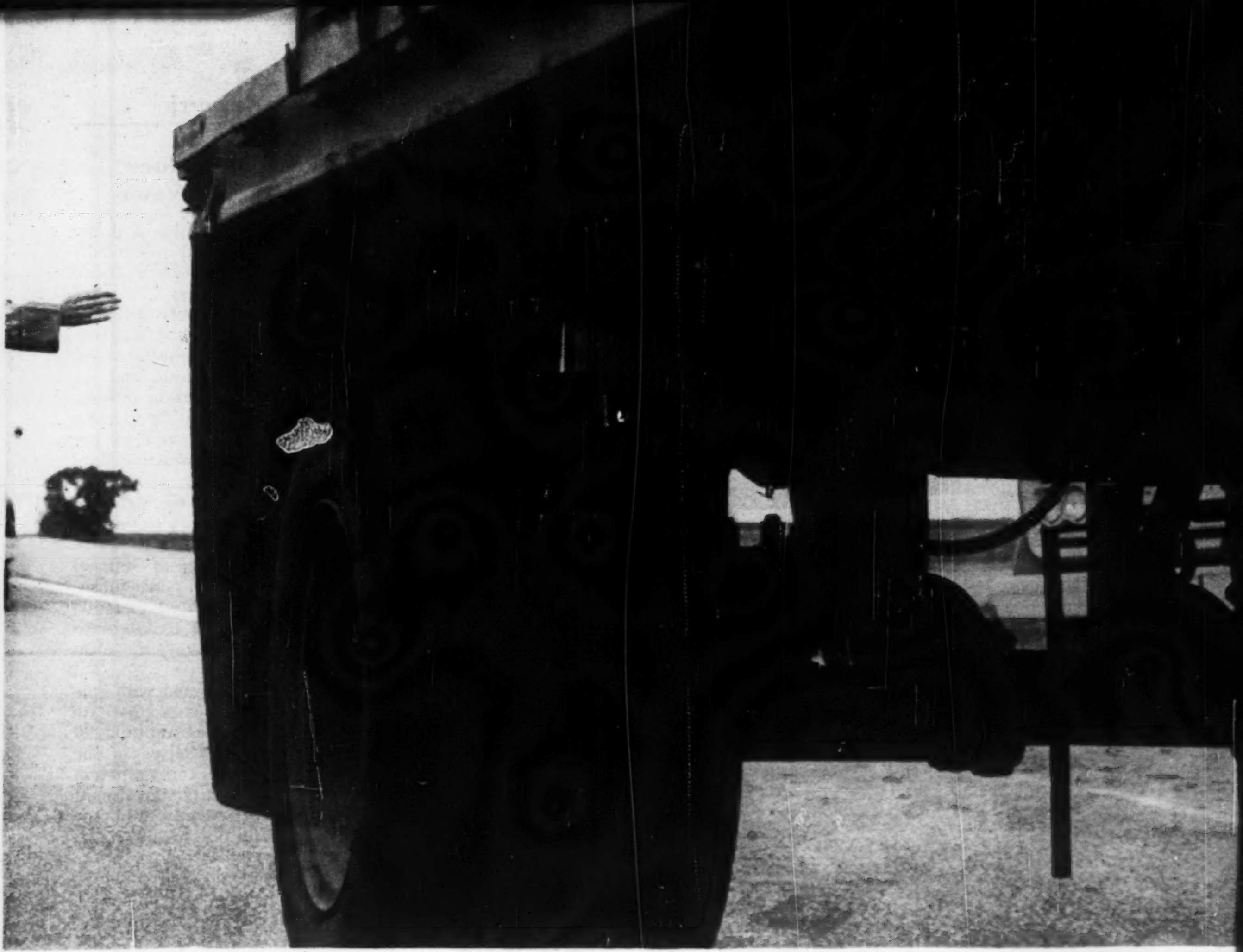
Never has there been a pavement study of such scope. On November 30th, near Ottawa, Illinois, the last trucks made their final runs—to complete the most exhaustive "in-use" testing that pavements have ever undergone.

There were 5 test traffic loops. Each provided a range of representative concrete and asphalt pavement sections. These were pounded over and over by trucks of specified weight rolling at a steady 35 mph. At the end of two years of traffic, every surviving section had absorbed the impact of 1,100,000 loads!

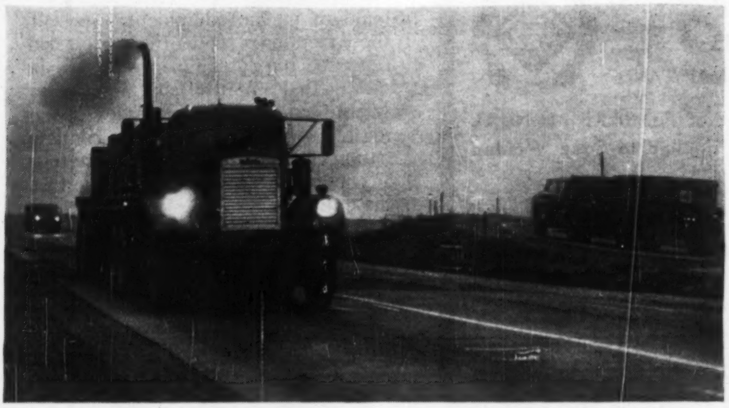
Some 5,000 precision gages and measuring devices were installed in the test pavements. Special instruments were designed to measure changes in surface condition. Readings by the millions were recorded and processed through electronic computers. The thoroughness of the research reflects the scientific direction of the AASHO staff and the Highway Research Board of the National Academy of Sciences—National Research Council.

National Road Test findings will help solve today's problems in highway design and construction. These findings will assist engineers, officials and legislators in providing efficient, economical roads and streets in the years to come.

PORTLAND CEMENT ASSOCIATION *A national organization to improve and extend the uses of concrete*



pound test pavements
National Road Test!



The fleet of trucks—from pickups to 54-ton semi-trailers—logged 17 million miles in circling five test loops.

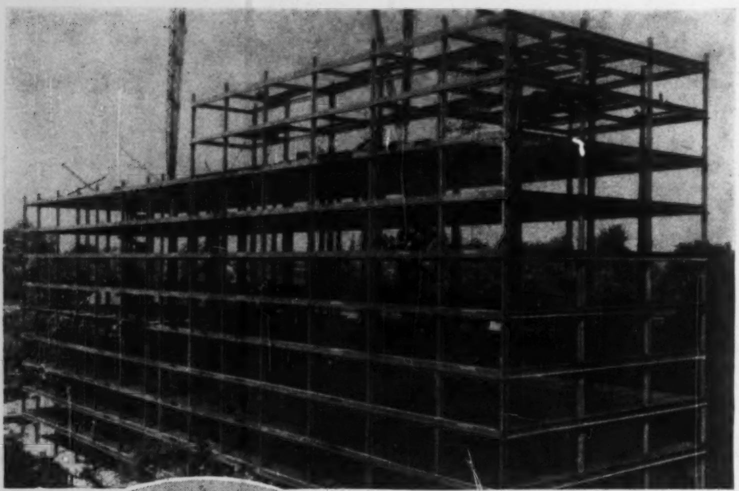
Most significant pavement test of all time!

The National Road Test is sponsored by the American Association of State Highway Officials.

Represented on the National Advisory Committee: American Association of State Highway Officials, American Automobile Association, American Trucking Associations, Inc., Asphalt Institute, Automobile Manufacturers Association, Automotive Safety Foundation, Bureau of Public Roads, Department of the Army, Highway Research Board, National Highway Users Conference, Portland Cement Association, Truck Trailer Manufacturers Association; petroleum industry; state highway departments; tire industry; universities.

Administered and directed by the Highway Research Board of the National Academy of Sciences—National Research Council.

Operated by a staff of engineering and technical specialists.



"Saxe welded connection units have been used in the construction of more than 5,000 buildings."

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☐ Send me a copy of the new 1960 edition of the **SAXE MANUAL FOR STRUCTURAL WELDING PRACTICE**, as applied to Saxe Welded Connection Units for Welded Assembly.

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Company_____

Street_____

City_____ Zone_____ State_____

12-60

Three Ways to Reduce Radioactivity in Water

Radioactive contaminants in drinking water can be reduced successfully using three methods recently tested by the Corps of Engineers.

Favorable results were obtained using a standard purification unit with chemical coagulation and diatomite filtration, a mobile ion-exchange unit and an electrodialysis demineralization process.

Fallout was simulated by adding finely ground radioactive soil to the water, bringing its contamination level to 660,000 units (micro microcuries per liter). Treatment by chemical coagulation and diatomite filtration reduced contamination to 5,000 units. A drinking water tolerance of 300,000 units is considered safe in emergencies. The standard purification unit, designed to remove suspended material from water, worked efficiently to remove insoluble radioactive soil.

Tests were also conducted with specially prepared contaminants that are 100% soluble in water. Strontium 90 and yttrium 90 were dissolved in the water source, bringing its contamination level to 1.8 million units. Treatment with the ion-exchange unit and the standard purification unit reduced contamination level to 830 units.

These tests were repeated using almost one curie of soluble cesium 137, which brought the contamination of the water source to 12.7-million units. Water with cesium 137 was also treated in the electrodialysis demineralization process, which consistently produced drinkable water of about 12,000 units.

Other processes tested included chemical coagulation followed by a sand filtration.

The performance of the sand filter was equal to that of the diatomite filter. The home softener removed about 90% of the solution strontium 90.

An important part of the field tests was the measurement of the radioactive build-up in the equipment, especially those sections in which the process concentrated the contaminant. Results indicate that in the continuous flow systems not requiring constant operating attention and at levels of contamination that were handled in these tests, an operator can satisfactorily perform his duties.

Both the ion-exchange and electrodialysis processes also function as water-treatment plants. Both processes were tested for demineralization of a brackish ground water supply. Each unit reduced the dissolved mineral content of a deep well water supply to an acceptable level.

14
Re-bars
21
22
28
29
30

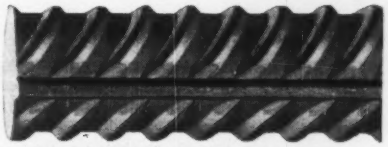
Reinforcing bars or any other steel needs . . . you get
"On-Time" Delivery from Sheffield

No need to tell a construction man how time counts. The difference between a job on schedule and one dragging its heels. The difference between profit and loss.

Sheffield's strategic locations and greatly expanded production capacity help you get your construction steel on time, in any quantity. Often with important savings in shipping costs.

Sheffield Crescent Reinforcing Bar, for example. And while we're on that subject, the advantages of Sheffield re-bars are worth remembering. The Sheffield "crescents" give the strongest possible bond of concrete to steel (6 to 1 shearing-bearing ratio). The bars distribute bond stresses so uniformly that they're self-anchoring. No necessity for hook anchorage in most cases. Sizes range through No. 18.

When time counts and strength counts, specify Sheffield crescent reinforcing bars.



SHEFFIELD

ARMCO

Crescent

Reinforcing Bars

Other Sheffield Construction Steel

Welded Wire Fabric • Structurals • High-Strength Structural Bolts • Merchant Bars • Heat-Treated Alloy Plates • Ring-Shank, Drive-Screw and Standard Nails • Shef-Ty Wire.

SHEFFIELD DIVISION

Sheffield Plants in Kansas City, Tulsa and Houston

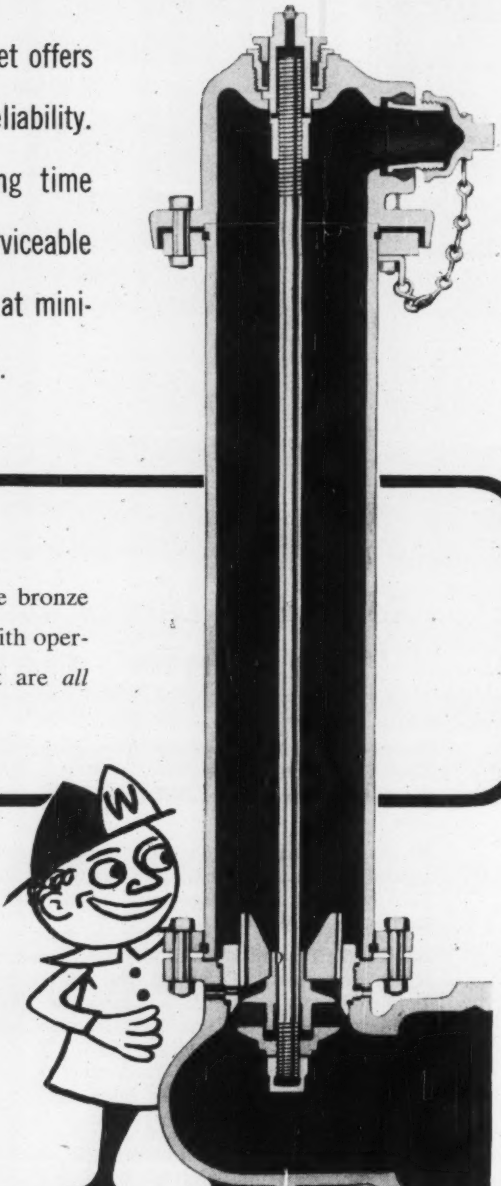
ARMCO

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

THE R. D. WOOD HYDRANT

The R. D. Wood Hydrant is simple in design, yet offers all the features needed for the utmost reliability. Your community would have to look a long time before it would find another hydrant so serviceable and rugged. For full neighborhood protection at minimum outlay, look first at R. D. Wood Hydrants.



BRONZE PARTS

Every point of friction is protected by at least one bronze surface. This assures against rust and interference with operation. The stuffing box, gland and operating nut are *all bronze*—corrosion-proof!

AND THESE FEATURES, TOO:

Valve opens against water pressure, remains closed in case of accident. Head revolves 360°. Optional break-point flange and breakable stem coupling permit quick repair without excavating. Optional extension piece can be inserted without shutting off water. Available with bell, mechanical joint or flange pipe connections; conventional or "O" ring packings.

Conform to latest AWWA specifications

R. D. WOOD COMPANY

Public Ledger Building, Independence Square, Philadelphia 5, Pa.

Manufacturers also of Mathews Modernized Hydrants, Mathews Flange Barrel Hydrants,
R. D. Wood Gate Valves, and "Sand-Spun" Pipe (centrifugally cast in sand molds)

SYLV
P50 4-60
LT WT 37000

When hopper cars won't empty this persuader makes them . . .

Shake, Rattle and Vibrate

The Model LE-10 car shaker is designed to shake and vibrate a hopper-bottomed railroad car to facilitate unloading of tightly packed materials from the car.

The big shaker—it weighs 4,200 lb—may be hung on the car side at any point without the use of any clamping devices. Equipped with two electric motors, one 10 hp and one 15 hp, the device gives the top of the car's side a heavy pounding while vibrating and pounding the lower portion right above the car pockets.

The larger motor is employed where unloading conditions require exceptionally strong shaking action. EASTERN CONSTRUCTORS, INC., POLAND, OHIO.

Rear Dumps for Heavy Duty

Two rear dumpers, the M-45SX and M-30X, are designed to heavy-service specifications.

The M-45SX is a 45-ton, six-wheel unit powered by a V-12 diesel engine that develops 450 hp at 2,100 rpm. Other V-12 engines, ranging from 420 to 525 hp, are optional.

Standard features on the M-45SX include eight-speed overgear transmission, 50-hp takeoff, and 100,000-psi alloy steel body. Its front axle weighs over 2,300 lb and has a rated capacity of 32,000 lb.

A four-wheel vehicle, the 30-ton M-30X has a six-cylinder diesel engine that develops 320 hp at 2,100 rpm. A 380-hp diesel is optional. A two-lever transmission has eight forward and two reverse speeds. MACK TRUCKS, INC., PLAINFIELD, NEW JERSEY

(*New Products continued p. 122*)

NEW

volume and density measurements in minutes

The new Beckman Model 930 Air Comparison Pycnometer* is a revolutionary means of making volume measurements for accurate, fast *density* determinations of irregular, powdered and porous solids.

- *Quick*...volume readings in one to five minutes, saving hours over conventional methods.
- *Convenient*...no liquids, no gas pressure determinations, no constant temperature baths, no fragile flasks or cumbersome apparatus.
- *Accurate*...direct digital readout to 0.1 cc, graduated to hundredths of a cc.
- *Rugged*...portable...mechanical, requires no electric power.

For more information about this time-saving new technique for making *true volume, apparent volume, porosity,* and *density* determinations, contact your Beckman authorized laboratory apparatus dealer, or write for Data File E-52-09.

*PAT. PENDING

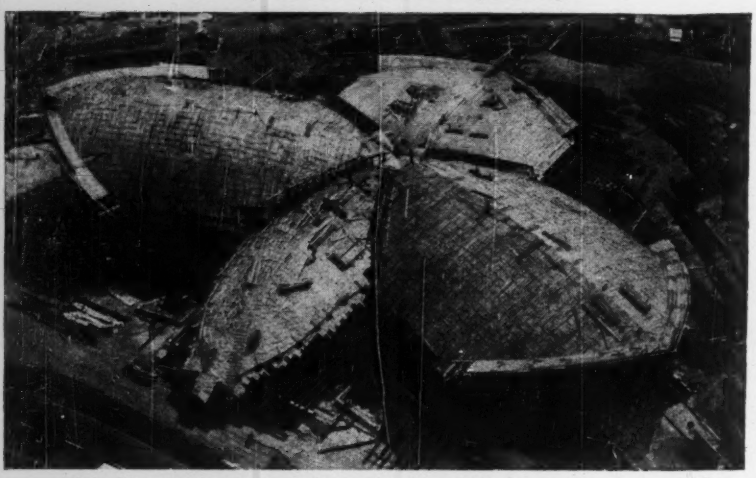
Beckman
Scientific and Process Instruments Division
Beckman Instruments, Inc.
Fullerton, California

SYLGAB STEEL & WIRE ACCESSORIES

selected for new
TWA TERMINAL

Eero Saarinen, Architect
Amman & Whitney, Engineers
Grove, Shepherd, Wilson & Kruge, Inc., Contractors

This revolutionary design, now nearing completion at N. Y. International Airport, presented a challenge to architects, engineers, contractors and suppliers. The execution of the design called for unique construction methods requiring minute, coordinated planning.



Sylgab's capacity to supply bar supports and other accessories according to specifications expedited the completion of the 1¼ acre roof. More than two million pounds of reinforcing steel supported by Sylgab products was interlaced with over 10 million pounds of concrete.

SYLGAB products offer two major time-saving advantages: they are designed for instant installation; they permit fast pouring due to high rigidity. In addition, our service assures delivery exactly when required.

Phone, Write or Wire For
SYLGAB CATALOG
your most reliable guide to Reinforced Concrete Accessories

Member Concrete Reinforcing Institute

BEAM CLIPS • SPECIAL COLUMN CLIPS
EXPANSIBLE CLIPS
STRAIGHT AND COIL WIRE
HAIRPIN CLIPS • TOGGLE HANGERS
FORM SPACERS • BAR ACCESSORIES

SYLGAB
STEEL & WIRE CORP.
79-05 Cooper Ave., B'klyn 27, N. Y.
EV 6-7806

Tunneler Compacts Earth As It Bores 2-in. Holes

No earth is removed during operation of a "power mole" that tunnels under roads, sidewalks, and driveways to make 2-in.-dia. holes up to 28 ft long.

The Model 14 EBW Vibrating Earth Borer, eliminates the need for excavating, pavement-breaking and resurfacing when laying a small pipe, cable or conduit, its maker says.

The tool has a flexible shaft that rotates a vibrating eccentric inside the head of a pointed steel borer. "Shaking" at a rate of 10,000 vibrations per minute, the borer noses through the earth. The boring head compacts the perimeter of the hole.

The unit is equipped with a 5-hp gasoline engine, has variable speed control, v-belt drive and countershaft. It is wheelbarrow mounted and designed to be transported and operated by one man. REMINGTON ARMS CO., BRIDGEPORT, CONN.

Drill, Insert Bits, Grinder Give Top Results

Tungsten carbide insert bits in combination with a drill by the same maker are said to drill larger diameter holes for optimum results with inexpensive blasting agents.

The new bits range in size from 4¾ in. to 8 in. in dia. The 5-in.-dia drill is 41 in. long with the bit attached. It is designed for service in the construction, quarry and petroleum industries. Drill weight is 148 lb and air consumption at 100 psi is 480 cfm.

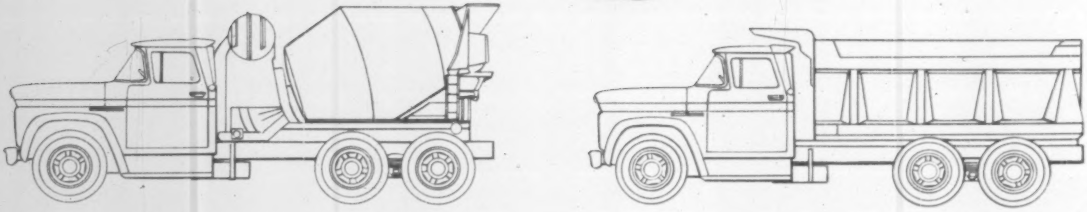
The same firm also has a bit grinder for custom grinding at the job site. Three types are available for portable, bench, or pedestal grinding.

Detachable bits measuring up to 12-in. in diameter can be sharpened with these grinders, according to the manufacturer. GARDNER-DENVER CO., QUINCY, ILL.

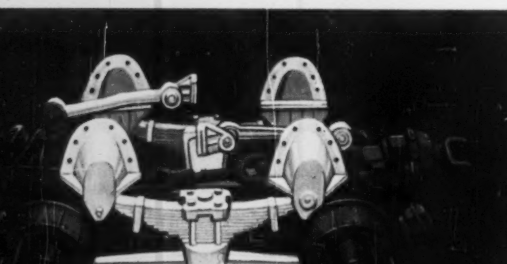
Torque Actuator Drives Truck-Mounted Boom

The ROTAC Actuator rotates the boom track of a truck-mounted crane to load and unload masonry. Maximum sweep is 280 deg.

After the masonry (brick or block) is stacked and strapped, workmen insert a multifork lift suspended by wire rope from a trolley into cored holes. A fluid motor drives the hoisting drum and another fluid motor drives the trolley along the boom track. EX-CELL-O CORP., 945 E. SATER ST., GREENVILLE, OHIO.



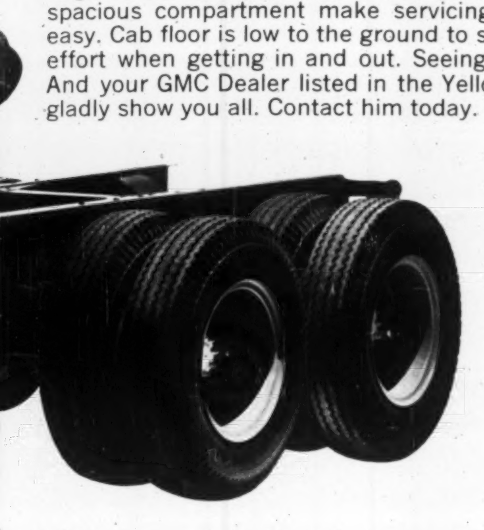
Typical examples of the construction uses of GMC Conventional 6-wheelers with 105" BBC.



Lightweight, Low-Maintenance Tandems—With this GMC suspension you have less truck weight, carry bonus payloads. Equalizing beam guarantees equal load on each axle at all times. Rubber mounts and bushings at all wear points eliminate lubrication, minimize service. Short, lightweight springs only support the load . . . torque rods transmit all driving and braking forces.

ONLY GMC EXCLUSIVE V-6 ENGINES GIVE YOU ALL THESE LIFE-EXTENDING, PROFIT-PRODUCING ADVANTAGES!

Low-Price . . . High-Performance . . . Easy-Service . . . Easy-In-And-Out Construction Trucks!—Now when you want to haul bigger loads, get added traction and flotation on your construction job—it's yours at modest cost with the new GMC 105″ BBC Conventional Six-Wheelers. Exclusive, extended-life V-6 engines are standard. Wide, full-opening hood and spacious compartment make servicing simple and easy. Cab floor is low to the ground to save time and effort when getting in and out. Seeing is believing. And your GMC Dealer listed in the Yellow Pages will gladly show you all. Contact him today.



NOW FROM GMC NEW, LOW-COST 6-WHEELERS!

QUICK FACTS—CONVENTIONAL 105″ BBC SIX-WHEELERS

SERIES	W5000	W5500
GVW	35,000-37,000 lbs. ▲	43,000-48,000 lbs. ▲
GCW	50,000 lbs.	60,000 lbs.
AXLES—FRONT	7,000-9,000 lbs. ▲	9,000-15,000 lbs. ▲
-REAR	28,000 lbs.	34,000 lbs.
BRAKES—HYDRAULIC	953 sq. in.	—
FULL AIR	943 sq. in. ▲	1100 sq. in.
ENGINE—V-6 GAS	351 cu. in. 180 hp. 401 cu. in. 210 hp. ▲	401 cu. in. 210 hp. —
TRANSMISSION	5-speed direct 3-speed aux. ▲	5-speed direct 3-speed aux. ▲

▲ = Optional

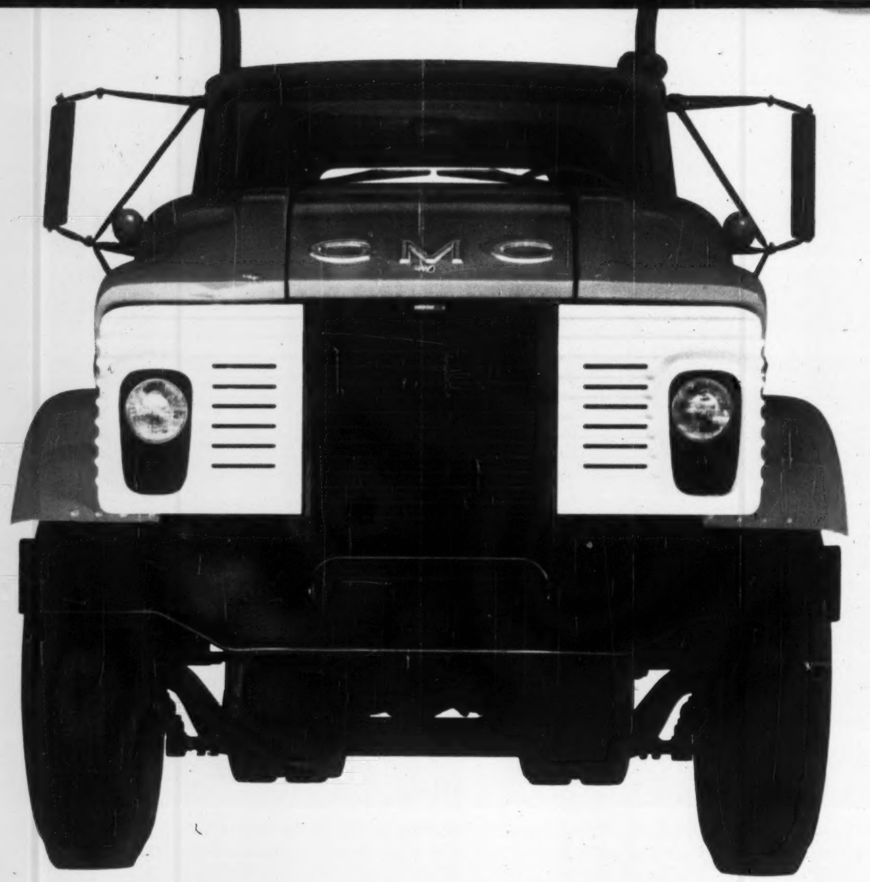
PULL HERE

- Heavy-duty GMC V-6 engines are designed to give you up to 200,000 miles of continuous operation without a major overhaul, with normal use and care.
- Usable power over an extended, low rpm range for higher performance and lower fuel costs.
- Compact block has staggered cylinders and 3-inch drop skirt for more strength and rigidity.
- Up to 176 gallons of coolant circulating every minute (over twice as much as many competitive engines) provide the flow necessary for life-prolonging heat transfer.
- Cooler-running, stronger, bigger sodium-filled valves with positive rotators give you extra-long life.
- Positive valve rotators (both intake and exhaust) give valves self-cleaning action to prevent sticking, pitting, warping, leaking and burning.
- Short, stiff Tocco-hardened V-6 crankshafts weigh twice as much as those in comparable V-8s . . . are stronger . . . have unsurpassed rigidity.

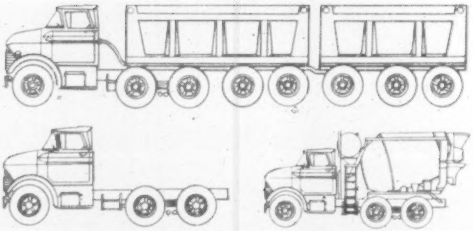
GMC
GENERAL MOTORS CORPORATION
TRUCKS

Another TRUCK TRIUMPH OF THE 60's!

From ½-ton to 60-ton . . .
General Motors leads the way!
GMC Truck & Coach—a General Motors Division—
Pontiac, Michigan.



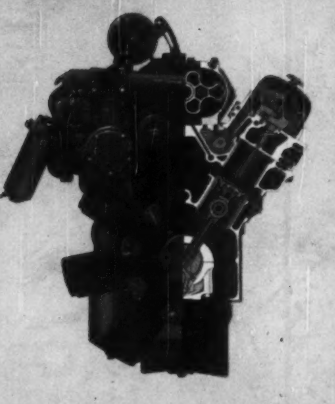
Big Span for Big Savings!—GMC's complete line of Conventional Ninety-Inch six-wheelers completely match your exact hauling requirements with full-range versatility in sizes, dimensions, power, gearing and strength. Whatever you need to cut job time and reduce operating costs, you can get from GMC. Giant-size DBW9000 with 90″ BBC and 120,000 lbs. GCW shown above.



Just a few popular construction uses of the GMC 90″ BBC Conventional 6-wheelers.

GMC 6-WHEELERS BATTLE RISING COSTS WITH

Built To Outlast All Others!—Heavy-duty GMC cabs are built extra strong and stiff to last on tough construction hauls. You get double-panel structure; 3 big cross sills; 2 double-flanged side sills with outside channel and inner plate at cab mountings; 2 rugged braces at cab floor and back panel; heavy-duty construction everywhere.



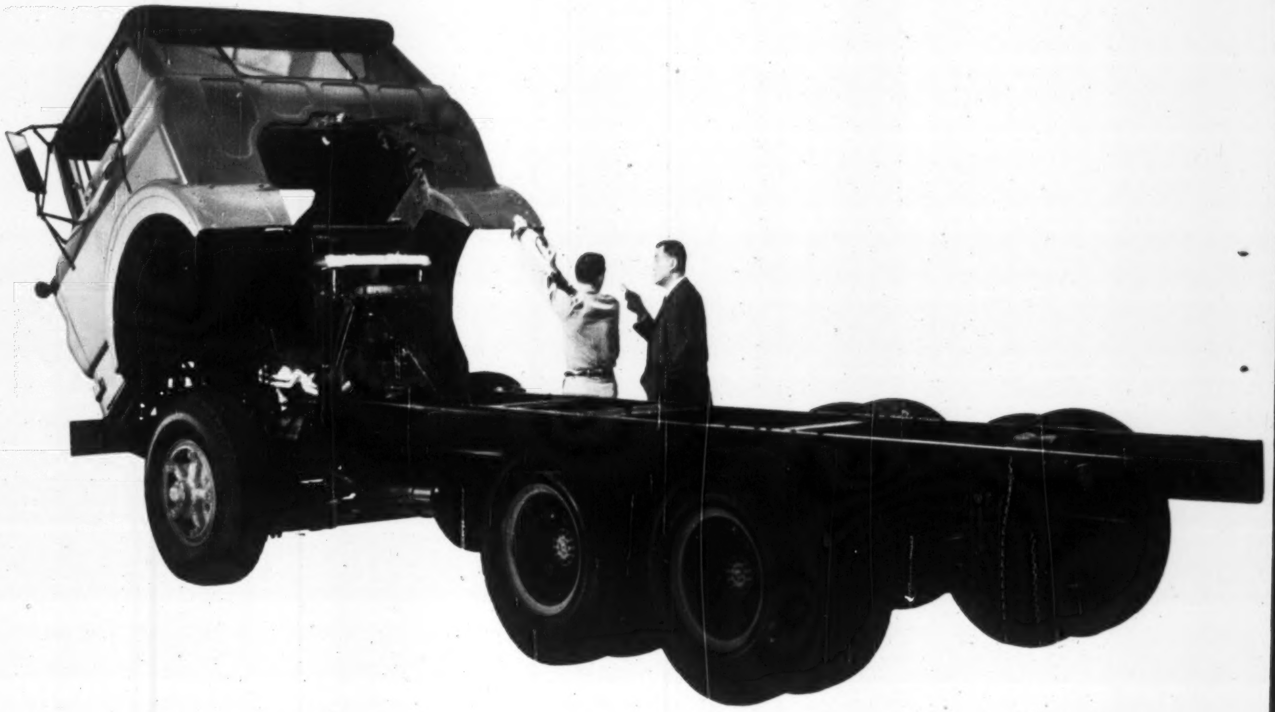
More Power Per Dollar, Per Cu. In., Per Pound!

GMC V-6 Diesels—New GMC diesels are hundreds of pounds lighter, several inches shorter and less expensive to operate than other diesels in their class. Two-cycle design gives you power on every down stroke, twice as often as four-cycle design. Smoother, more responsive power permits you to get loads moving fast and keep them moving, day after day, and year after year.

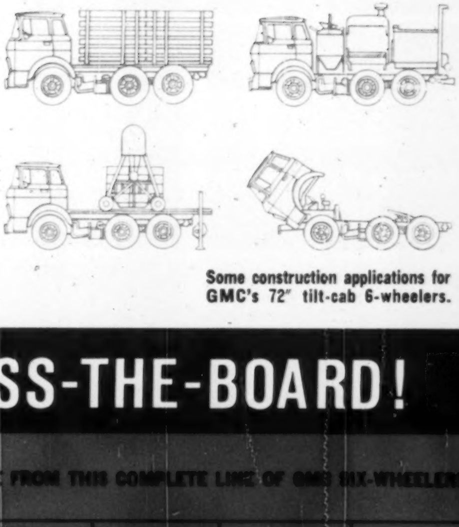
Torque—577 to 604 lbs.-ft. Horsepower—189 to 218.

Stronger, wider-track front axles and wide-spaced springs for greater stability and shorter turning.

New-design frames can withstand the hard and grueling construction service.

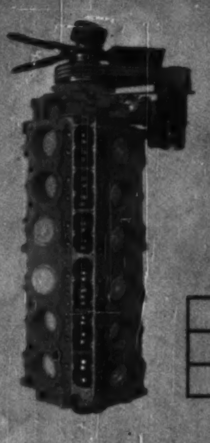


Tilts at a Touch!—Tilting is an easy, one-man job with counter-balanced cab and trouble-free torsion bar spring. Engine is completely exposed. Stationary control island assures permanent positioning of controls for proper operation. Big-payload tilt-cab six-wheelers with 72″ BBC and 52″ set-back front axle cover the range—37,000 lbs. GVW to 76,800 lbs. GCW, LW7000 shown with exclusive Twin-Six.



Some construction applications for GMC's 72″ tilt-cab 6-wheelers.

BIG, NEW ADVANCES ACROSS-THE-BOARD!



Most "GO" You Can Get!

Exclusive GMC Twin-Six—Save job time, cut gear shifting up to 60% with the most powerful gas engine offered as standard equipment. This greatest load-moving power produced at low-stress, easy-stroking rpm also greatly extends engine life and cuts operating costs.

Profit-Performance On Every Haul		
Model	**Gross Torque Range**	**Max. Horsepower**
702	625-630 @ 1400-2100	275 @ 2400

CHOOSE FROM THIS COMPLETE LINE OF GMC SIX-WHEELERS

SERIES		GVW	GCW	ENGINE
105″ BBC—	W5000	35,000-37,000	50,000	V-6 180 hp.
	W5500	43,000-48,000	60,000	V-6 210 hp.
90″ BBC—	BW5000	35,000-37,000	50,000	V-6 180 hp.
	BW5500	43,000-48,000	60,000	V-6 210 hp.
	BW7000	45,000-52,000	65,000-76,800	V-12 275 hp.
	BW9000	59,000-64,000	90,000-120,000	V-12 275 hp.
	DBW7000	45,000-52,000	65,000-76,800	*V-6 218 hp.
	DBW9000	59,000-64,000	90,000-120,000	*V-6 218 hp.
72″ BBC—	LW5000	37,000	50,000	V-6 180 hp.
	LW5500	45,000-48,000	60,000	V-6 210 hp.
	LW7000	45,000-52,000	65,000-76,800	V-12 275 hp.
	DLW7000	45,000-52,000	65,000-76,800	*V-6 218 hp.

*Diesel—Max. Power

Easy-shifting, high-torque-capacity transmissions for the most particular buyer and most unusual application.

Bigger brakes mean surer, safer stops. Longer life, too, with increased lining areas.

Long, Narrow Ripper Point Gets More Production

Dramatic increases in ripping production are said to accompany use of a ripper point with long, narrow, sharp configuration and made of special alloy steel.

According to the manufacturer, the extra length of the point shatters material well ahead of the ripper shank, thus reducing shank wear. Coupled with the flat pitch of the point, this feature reduces drawbar pull and may allow the tractor to operate in a higher gear, or the addition of extra shanks to one drawbar.

The points are available in four lengths (14, 16, 18 and 20 in.) to match ripping conditions. ELECTRIC STEEL FOUNDRY CO., CONSTRUCTION EQUIPMENT DIV., 2141 N. W. 25TH AVE., PORTLAND 10, ORE.

Material Handling Crane Has Hydraulic Boom

The Model H-5 material handling crane is an all-hydraulic, rubber-tired machine with five-ton capacity.

The crane is powered by a Continental six-cylinder gasoline engine. The transmission has four speeds forward and one in reverse. The boom swings in a 360-deg arc and telescopes hydraulically from its 10-ft basic length to an extended length of 18 ft.

Dual wheels are on the front drive axle and single wheels on the rear steering axle. The crane travels at speeds up to 20 mph. The machine is equipped with four-wheel hydraulic brakes and hydraulic power steering. HANSON CLUTCH AND MACHINERY CO., TIFFIN, OHIO.

Six Models Beef Up Deere Tractor Line

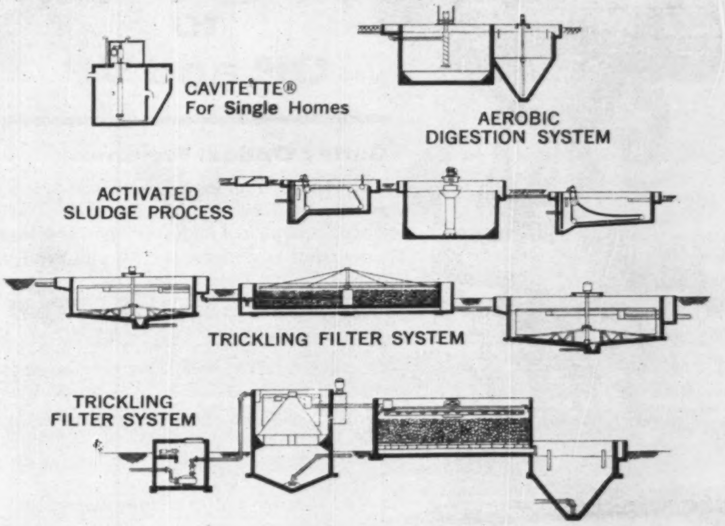
In an expansion of the John Deere tractor line, two crawler series will be manufactured in 40- and 50-hp engine sizes. Wheel tractors will include four models of 40, 50, 60 and 85 hp.

The four- and six-cylinder valve-in-head engines will operate at speeds up to 2,500 rpm. Gasoline or diesel options will be offered. All the tractors will be available with power-matched equipment.

Hydraulic controls are included on the new line. On the crawler-loader units, a single lever controls all movements of the loader lift arms and the bucket. On both crawlers, a T-bar control for all-hydraulic bulldozers will operate all blade functions. DEERE & CO., MOLINE, ILL.

(*New Products continued p. 130*)

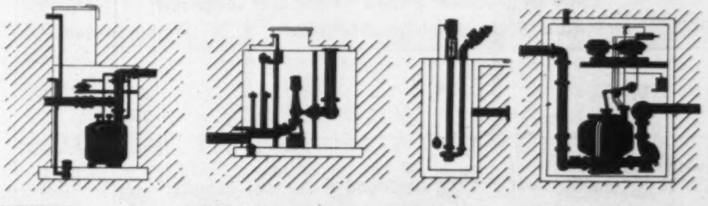
SEWAGE TREATMENT SYSTEMS



Everything the Construction Industry Needs to Treat or Pump Sewage

For schools, hospitals, subdivisions, motels, factories, etc. . . . whatever the economics, degree of treatment required, topographical conditions, expected life of installation or expandability, Yeomans offers you the equipment to solve any sewage-handling problem. It is the world's most extensive line and backed by the experience of a specialist. See Yeomans inserts in Sweet's Catalog—Architectural and Light Construction files.

SEWAGE LIFT STATIONS

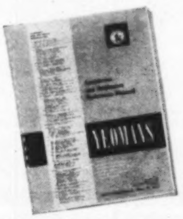


PNEUMATIC UNDERGROUND STATION "Package" design including structure. Easy to service, sanitary, low maintenance.

CENTRIFUGAL UNDERGROUND STATION Quality "package" design with short-coupled dry-pit pumps. Nominal cost.

CONVENTIONAL WET-PIT Low first cost, familiar installation and maintenance. Commercial or residential.

TOPS IN DEPENDABILITY Shone® Pneumatic Ejector—25-Year Warranty! Maintenance free. Lowest over-all cost.



Write for Yeomans "Architects and Engineers Reference Manual," No. 1117.

YEOMANS
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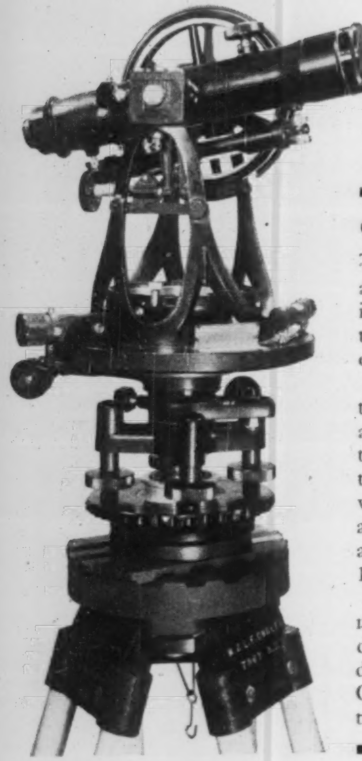
City__________Zone_____State_____

TL-6028



A Guide to OP and VP

Gurley Optical Plummet

The Optical Plummet Transit opens new avenues in accuracy, speed and convenience...eliminates inconvenience and lost time involved in centering a plummet over a point.

The Optical Plummet is a telescope through the vertical center (spindle) of a transit. It will point vertically when the transit plate is level. The telescope is turned at right angles by a prism, so that vision is actually horizontal. Setting and adjustment may be checked very simply and precisely by rotating the instrument 180 degrees.

The Gurley Shifting Head Tripod permits 1¾" movement of the transit in two directions 90° separated, without material disturbance to the level of the plate (the Optical Plummet thus remains operative through the entire centering procedure).

Advantages of the Gurley Optical Plummet Transit

- Saving in set-up time, as much as 33%—a factor when a crew is waiting.
- Eliminates swaying plumb bob.
- More accurate centering over point.
- On construction work—sights on points some distance below, such as encountered in bridge work and building construction.
- Made in U.S.A.—Little servicing, but easily repaired when necessary.

Gurley Optical Plummet Transits Available in 21 Combinations

With Circular Compass	With Trough Compass	Without Compass
OP-52	—	OP-57
OP-62	—	OP-67
OP-132	OP TC 137	OP-137

And with limb reading to 1 min.; or 30 sec., or 20 sec. . . . Stiff-leg or Extension-leg Tripods with Constant-Level Shifting Head and wide-frame European-type construction.

Variable Power is standard on Gurley Transits and Levels:

- Wide range of magnification with **one** eyepiece—zooms for near or distant objects
- Easily adjusts to suit weather and light conditions
- Built-in haze filter

At high power:
- longer shots
- less glare in bright sunlight
- increase in readability
- no glare...high contrast
- blacks and whites stand out

At low power:
- greater field
- brighter field
- decrease of heat waves

We will be pleased to send you further information about both Gurley Optical Plummet Transits and Gurley Variable Power Eyepiece.

Both Optical Plummet and Variable Power are patented.

W. & L. E. Gurley • Union Plaza, Troy, N. Y.

Panel Lights Are Available For Custom Installations

Panelescent lamps are available in new commercial and custom products. They light metal panel surfaces by sending an electric current through a layer of phosphors—a process called electroluminescence. The lamps produce a uniform glow without glare, do not use bulbs, tubes or filaments.

An electric-light wall switch plate, called Nite Lite, provides a green Panelescent guide light in darkened rooms for more than five years, says the manufacturer. It is available for single toggle switches, is activated when the switch is turned off and extinguished when it is turned on. The Panelescent lamp in the switch plate shines through a white plastic covering.

Large-scale custom-made Panelescent lighting products are also available in sheets as large as 5x3 ft, according to the maker. They can be used for table tops, walls, ceilings and highway signs. Custom-built lamps come in several colors; commercial lamps are green. The manufacturer plans future applications of Panelescent lighting in building exteriors, highway pavements and airport runways.

Panelescent lamps, developed ten years ago by Sylvania, are used commercially in clock faces, radio dials and instrument panels. SYLVANIA ELECTRIC PRODUCTS INC., 730 THIRD AVE., NEW YORK 17, N. Y.

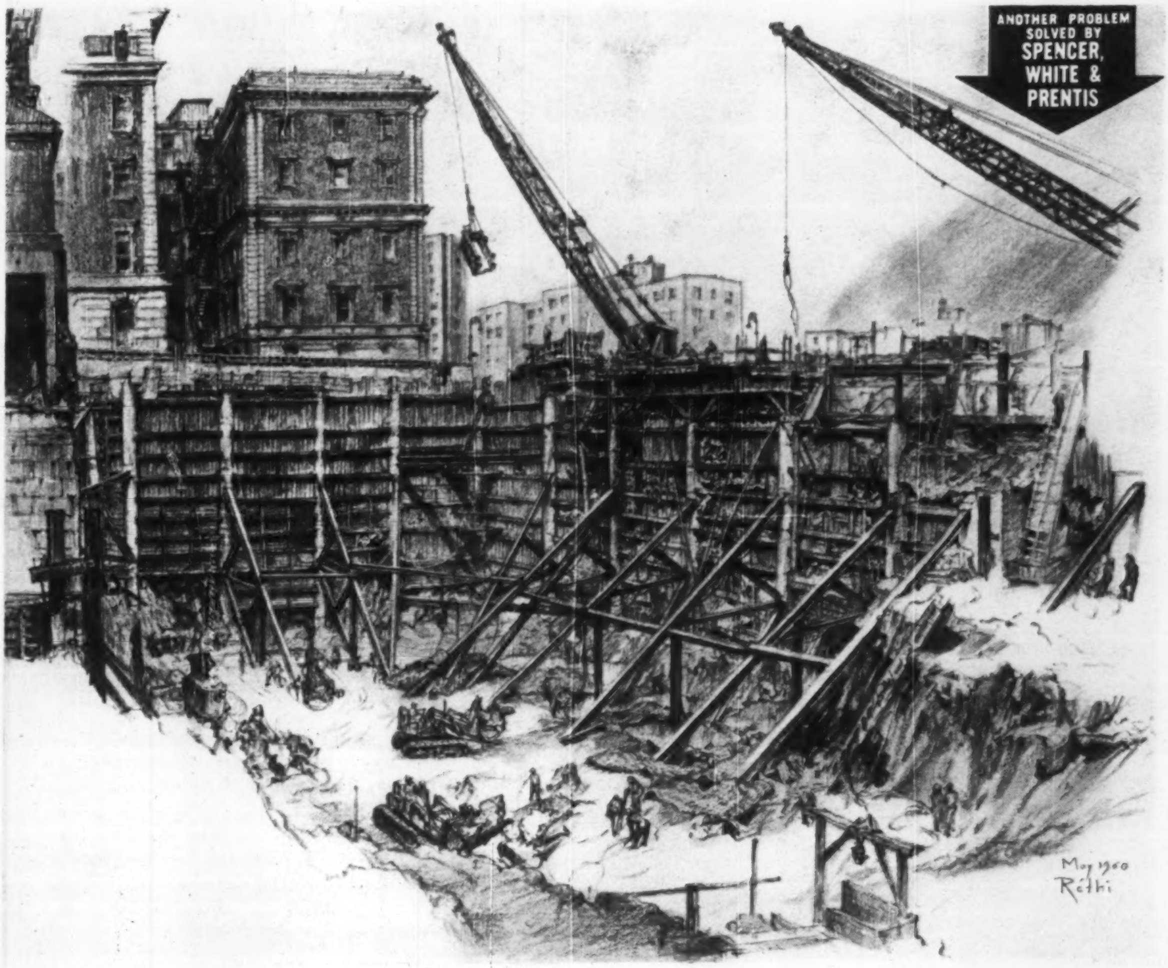
Detector System Controls Traffic, Counts Vehicles

The Ve-Det, an electronic detector system operating from circuits embedded in highway pavements, adjusts signal lights according to the density of traffic, and records the passage and speed of vehicles.

The all-transistor Ve-Det (vehicle detector) system employs a wire loop buried in the roadway surface. When a vehicle passes over this loop, a signal is received by the portable detector, which measures 4x5x7 in. The detector can be moved to any wire installation loop.

One detector will cover any selected road lane. Mass detection across as many as eight lanes is possible by use of a special loop design. Two detectors operating from a common power supply unit provide separate coverage of two adjacent lanes.

The detector may be connected with a counting device, turnpike toll booth indicator or with an automatic garage door opener. RADIO CORP. OF AMERICA, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.


ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS
May 1960
Rothi

Project: 100′ x 260′ foundation for addition to New York City's Mt. Sinai Hospital
Architect: Eggers & Higgins, New York City
Engineer: Weiskopf & Pickworth, New York City
General Contractor: Psaty & Fuhrman, Inc., New York City

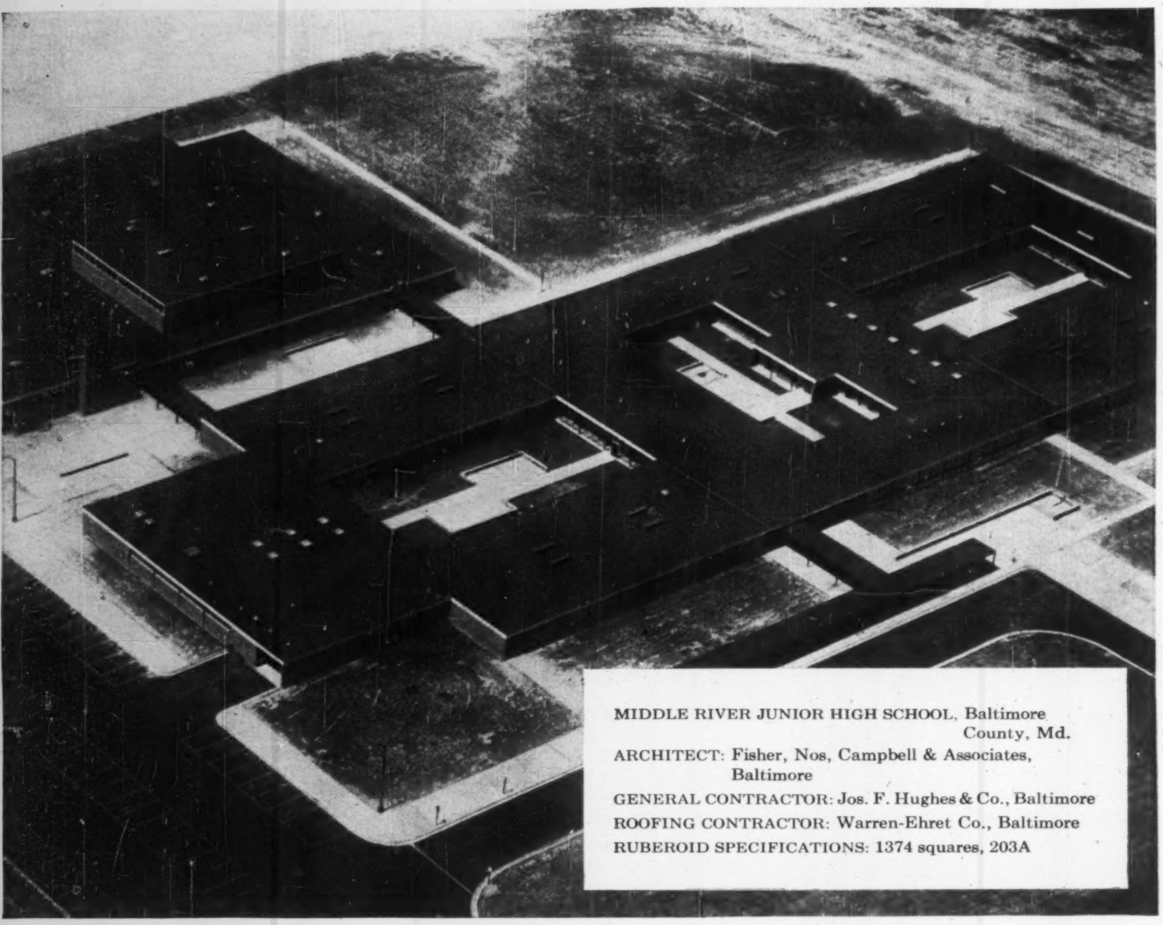
NEW METHOD OF BANK SUPPORT:

DRILLED-IN CAISSONS USED AS MASTER PILES IN SHEETING 50′ DEEP CUT THROUGH ROCK FILL

In digging this foundation, the shovel unexpectedly struck large pieces of blasted rock, probably dumped as fill during subway excavating many years ago. Since the soldier beams of the originally-planned conventional system of sheeting and bracing could not be driven through these massive boulders, it became necessary to devise some other method of supporting the 50′ deep cut.

Solution: in what is believed to be their first use for such a purpose, Drilled-In Caissons, long a specialty of Spencer, White & Prentis, were successfuly employed as Master Piles. The 30″ diameter caissons, about 20′ on centers, were drilled and driven through the boulder fill. 10″ - 42# cores were then installed, concreted and socketed 4′ into bedrock. Descriptive literature on request.

Spencer, White & Prentis INC.
10 E. 40th St., New York 16, N. Y.
Detroit: 2033 Park Ave. • Chicago: 221 North LaSalle St. • Washington, D. C.: Tower Bldg.



MIDDLE RIVER JUNIOR HIGH SCHOOL, Baltimore County, Md.
ARCHITECT: Fisher, Nos, Campbell & Associates, Baltimore
GENERAL CONTRACTOR: Jos. F. Hughes & Co., Baltimore
ROOFING CONTRACTOR: Warren-Ehret Co., Baltimore
RUBEROID SPECIFICATIONS: 1374 squares, 203A

RUBEROID'S TIME TESTED SPECIAL BITUMEN
heads the class in roof protection

Applied 28 years ago—still in service. The Accomac Elementary School, Accomac, Virginia—a typical example of economy and durability with RUBEROID roofing. This Special Bitumen job, done in 1932, is a four ply 15# Asphalt Felt, Bitumen and gravel surface on one inch of insulation.

Long roof life and RUBEROID Special Roofing Bitumen are synonymous. Proven time and again on jobs like the Accomac School, Special Bitumen is today's choice for tomorrow's weather-tight, maintenance free, built-up roof.

The plus values of durability and an engineered application by a RUBEROID Approved Roofer are your assurances of quality this year, next year and for many years to come. It's a combination that can't be topped in the built-up roofing industry.

Specify RUBEROID Special Roofing Bitumen on your next project and get those extra years of roof life.

For detailed RUBEROID Specification Data, write to: The RUBEROID Co., 500 Fifth Ave., New York 36, New York.

The RUBEROID Co.®

see our catalog in S or write for copy

Men and Jobs

Air Force General Named 'Outstanding Contributor'

Maj. Gen. Augustus M. Minton, the Air Force's Director of Civil Engineering, has received the annual award for "outstanding contributions to the engineering profession" from the District of Columbia Society of Professional Engineers, marking the first time a military man has received this distinction.

General Minton, 49, is registered in the District of Columbia as a civil engineer and as a mechanical engineer. In the three years since he took command of the Air Force civil engineers, he has pushed a program to have every engineer in his command registered (ENR May 26, p. 66).

The general—currently president of the Society of Military Engineers—says that becoming licensed as a professional engineer is "the most important thing my men can do to enhance the prestige of their profession, their service and themselves."

The D. C. Society is a part of the National Society of Professional Engineers. General Minton's name is being submitted to NSPE for the national award for outstanding contribution to the engineering profession. The national award has been conferred only 10 times in NSPE's 36-year history.

Corps Colonel Elected By State PE Society

Colonel Paul H. Symbol, Walla Walla District Engineer for the Corps of Engineers, has been named to head the Washington Society of Professional Engineers. He takes over the reins from president John R. Wallace of Seattle.

Col. Symbol, a Washington State University graduate with a master's degree in mechanical engineering from Cornell University, was commissioned in the Corps in 1939. In addition to working on the Alcan Highway, he has served as executive officer for the Construction Division of the U.S. forces in Europe. Later he was for three years the chief of the Corps' Family Housing Division.

After a stint as executive officer for the Seattle District, he became District Engineer in 1958.

T. A. Marshall Elected ASTM Executive Secretary

Thomas A. Marshall, Jr., has been elected executive secretary by the American Society for Testing Materials. At present he is senior assistant secretary of the American Society of Mechanical Engineers.

Fred Van Atta, formerly assistant secretary of ASTM, was elected treasurer, with responsibility for business operations of the society.

Robert J. Painter, formerly executive secretary and treasurer, will continue as consultant to the executive secretary.

Mr. Marshall, a native of Savannah, Ga., graduated from Georgia Institute of Technology in 1932 with a BS degree in aeronautical engineering.

Briefs . . .

Public Works

Construction engineers have been announced for two major projects of the Bureau of Reclamation: **James R. Granger** will direct construction of the Yellowtail Unit of the Missouri River Basin Project. His work includes a 520-ft-high concrete arch dam on the Big Horn River in Montana and a small regulating dam downstream from it. The Curecanti Unit of the Colorado River Storage Project goes to **James D. Seery.** Two dams will be built in the Curecanti Unit on the Gunnison River in Colorado.

The World Bank has appointed **Lieut. Gen. Thomas B. Larkin,** U.S.A. (Ret.) as technical director of a comprehensive study of transportation in Argentina. The study—jointly financed by the World Bank, the Argentine government and the United Nations Special Fund—will be the basis of a long-term program for developing Argentina's transportation network.

Donald C. Tillman, senior civil engineer in the West San Fernando Valley District of Los Angeles' Bureau of Engineering, has been named commissioner on the city's five-man Board of Public Works. The vacancy on the board was created by the retirement of board president **Cushing Phillips.**

John J. McMahon, owner of a Detroit engineering firm, has been elected chairman of the Michigan State Highway Department's Industry Advisory Committee, a liaison group between the State Highway Department and the highway construction industry.

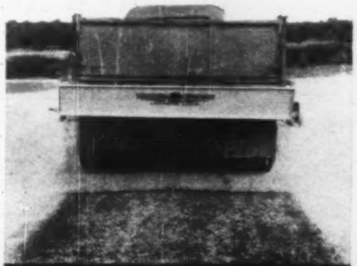
As part of a general decentralization movement, the State Highway Department of Maryland has created two new positions—Contracts and Design Engineer, to go to former State Construction Engineer **L. W. Novinger;** and Projects and Materials Engineer, to go to **Stanley Scarborough,** formerly in the office of testing and materials.

SWENSON the Summer-Winter Spreader...

U. S. Army Photograph

for resurfacing and ice control

Spread sand, gravel, salt, calcium chloride, cinders or any combination of these materials. Clutch-controlled from cab of truck. Any desired rate-of-flow. Steady or intermittent up to 30 M.P.H. Narrow strips or full traffic lanes. Forward or reverse. Models to fit any dump-truck box. Chain or hydraulic drive. Speed summer construction jobs, dust control, soil stabilization. Handle winter ice-control problems faster, safer, more efficiently. Write for complete information.



SWENSON SPREADER
LINDENWOOD, ILLINOIS

"There is hardly anything in the world that someone cannot make a little worse and sell a little cheaper—and the people who consider price alone are this man's lawful prey."

—John Ruskin

you can buy a cheaper engine...
but you can't buy a better one

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ENGINES AND POWER UNITS

Famous in Construction Work for 40 Years

See your Waukesha distributor, or consult us concerning your power needs.

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Obituaries

Theodore I. Coe, 88, Washington, D. C., architect and long-time leader in his profession. Mr. Coe went to Washington in 1932 to supervise construction of the Supreme Court Building and remained as technical secretary of the American Institute of Architects. Over the years he was also executive secretary of the U.S. Construction League, chairman of the board of zoning adjustment of Washington and founder and first president of the Washington Building Congress.

Andrew Fischer, 70, heavy-construction engineer in New York City. He formerly was executive vice president and director of James Stewart Co. and later was vice president of the Cauldwell-Wingate Co., builder of the Veterans Hospital, Peter Cooper Village and the Beekman-Downtown Hospital, all in New York City. He was also in charge of building the West Side Highway in New York and from 1955 to 1958 he was consultant for the Chase Manhattan Bank Building under construction in Manhattan.

Ivan C. Crawford, 74, former dean of the colleges of engineering at Michigan (1940-51), Kansas (1937-40) and Idaho (1923-28) universities. From 1928 to 1937 he was director of the Idaho Engineering Experiment Station. Professor Crawford was director of the Colorado Water Conservation Board from 1953 until 1958, when he retired. A 1912 graduate of the University of Colorado, he had also served the federal government in many capacities over the past 30 years as a consultant on national resources, irrigation, water supplies and power.

Charles Adams Bigelow, 78, former vice president and director of Stone & Webster Engineering Corp. He joined the company in 1908 as an engineer on the Hauser Lake Dam Project in Montana; was elected vice president and director in 1926; and had been in San Francisco as manager of the western area from 1931 until his retirement six years ago.

Harold G. Wilson, 42, architect for commercial and residential buildings in Philadelphia area. His works included more than half the 76 buildings at Valley Forge Military Academy.

W. Sherman Smith, 68, assistant dean of the college of engineering at Ohio State University. A civil engineer, Professor Smith specialized in traffic engineering and had been with the university since 1915.

SACRED HEART RESIDENCE FOR THE AGED
PHOENIX, ARIZONA

Architect: Lescher and Mahoney, Architects and Engineers Ltd.
General Contractor: Wm. Peper Construction Co.
Lathing and Plastering Contractor: Allen R. Smith Plastering Co.
Distributor Penmetal Structural Framing: C & R Distributing Co.
Dealer Penmetal Lath Products: Arizona White Eagle Stucco Co.

Another architect selects Penmetal products for quality...permanence...economy

Faced with the problem of achieving construction excellence at reasonable cost, the designers of Sacred Heart Residence for the Aged turned to Penmetal products. Partitions throughout were erected using Penmetal nailable studs and plaster over Meshtex lath. This combination provided the privacy so essential in a building accommodating 150 people, while assuring fire integrity and freedom from maintenance. Penmetal's unique expansion joint was used to panel ceilings for protection against plaster cracking as well as a work stop for plasterers.

Builders everywhere are finding it profitable to use Penmetal as a single source for a variety of building products and plastering accessories. If you are interested, send for catalog SS-38 *"Penmetal Structural Framing"* and catalog 633-L *"Metal Lath and Plastering Accessories."*

PENN METAL COMPANY, INC.

Sales Office: P. O. Box 1460, Parkersburg, W. Va., AXminster 5-4521
Executive Offices: 40 Central Street, Boston 9, Mass.
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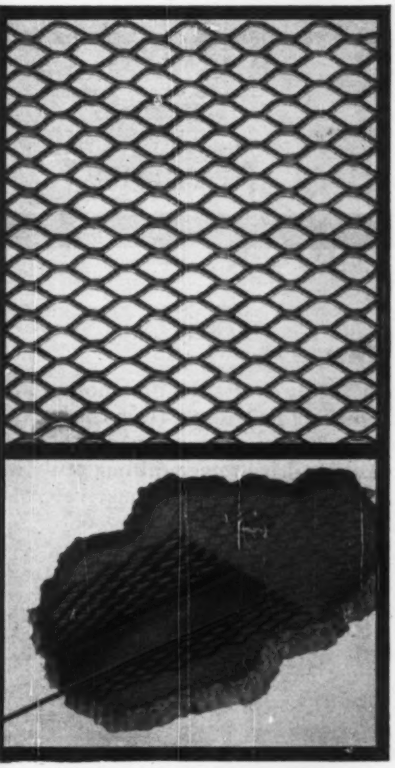


Above: Penmetal Meshtex lath and plasterer's expansion joint—two of the many Penmetal products used in the building. **Left:** Penmetal nailable studs were used for all interior partitions, and Penmetal channels for the suspended ceilings.

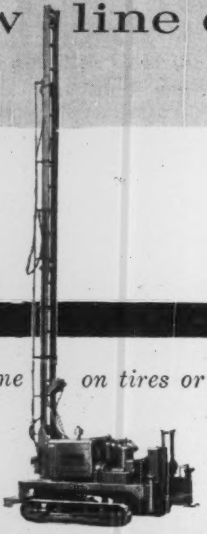
METAL MARK
Penmetal
1869
OF QUALITY

a name to remember

PM-267

ANNOUNCING LE ROI'S

A new line of powerful . . . highly portable . . .



These rigs come on tires or tracks!

THE LRD-2

Here's a highly portable blasthole drill for making hole up to 4½ inches as deep as 30 feet . . . equipped for either positive-drive rotary drilling or powerful down-the-hole percussive drilling.

What's more, the LRD-2 is completely self-contained . . . and economically priced, too!

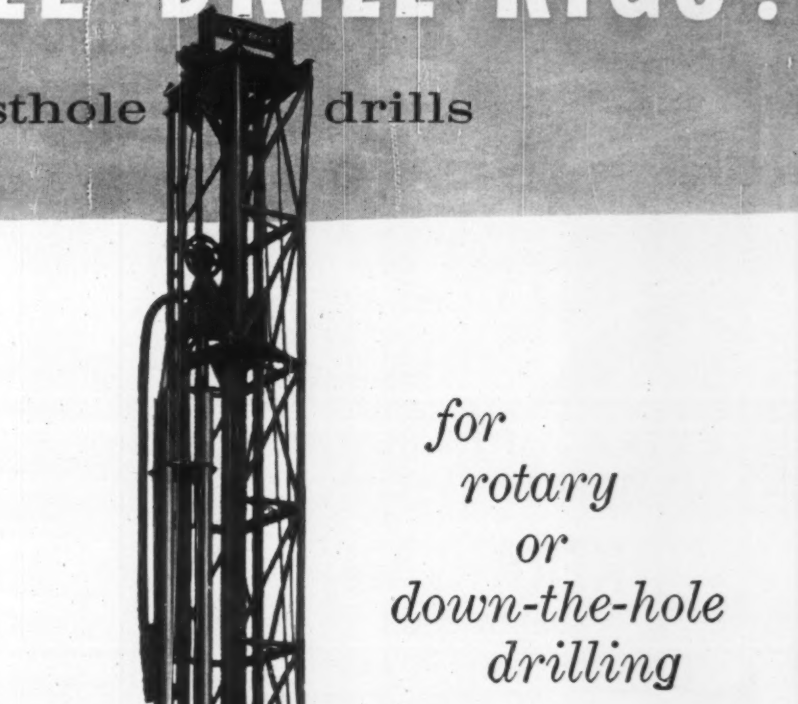
The entire unit is easily handled by one man. Controls are conveniently grouped at an operator's station located alongside the drilling area. The unit can be moved, leveling jacks hydraulically set, boom hydraulically raised, drill pipe and bits connected, and hole started — all with a few non-fatiguing motions.

Powerful direct mechanical drive keeps the rotary table turning — won't bog down or lose torque under rough going like air or hydraulic driven units — eats through tough rock formations under 10,000 lbs. pulldown pressure at speeds from 40 to 250 rpm. If necessary, a hard-hitting down-the-hole drill can quickly be substituted for the rotary bit to drill extremely hard rock formations. A Le Roi 25 hp two-stage air compressor provides ample air for powering the down-the-hole drill and cleaning out hole . . . or is available in single-stage where only rotary drilling is necessary.

The self-propelled LRD-2 is available either on crawler or tire mounting and with either gasoline or diesel power unit. A whole list of extra equipment is available to ease or speed drilling, including lights for night-time operation, a mounted bit grinder, air hoist, breakout tongs, water injection system, etc. . . . all detailed in Specification Sheet AT-146. Write for your copy.

DEEPHOLE DRILL RIGS!

rotary blasthole drills



for rotary or down-the-hole drilling

THE LRD-3

Here's the *big* rig . . . completely self-contained for putting down hole as large as 7⅜ in. to 100 ft. depth!

The LRD-3 is available with either crawler or truck mounting. An enclosed cab can be furnished to provide all-weather protection for the operator while drilling. All controls are conveniently grouped for easy operation and good visibility.

The traveling head design of the LRD-3 provides positive mechanical power without excessive torque loss under heavy pulldown, and permits easy control in making up and breaking down drill-rod. Every function of the unit is designed to speed productive drilling and keep the operator making hole. Leveling, raising the mast, and even the automatic drill pipe magazine are hydraulically controlled for speedy operation. A powerful dust collector traps cuttings and blows them well away from the unit.

An extra-sturdy 4-speed chain-hydraulic pulldown puts up to 30,000 lbs. of pressure on the bit of the LRD-3. A rugged dual-range transmission provides rotary speeds from 9 to 168 rpm in a selection of 10 forward and 2 reverse speeds.

Where needed, the rotary bit can be quickly changed for a powerful down-the-hole drill. A Le Roi 100 hp dual-manifold air compressor provides plenty of 100 psi air for punching through tough rock with the down-the-hole drill, or it can be set to deliver 625 cfm of 40 psi air for fast, efficient removal of cuttings in rotary operation.

The LRD-3 comes complete with a hydraulically operated magazine with capacity for four 20 ft. drill pipes, and can be equipped with optional convenience equipment similar to the LRD-2. Specification Sheet AT-147 describes the unit in detail, with complete spec information. Send for a copy.

LE ROI
division of Westinghouse Air Brake Co.
Sidney, Ohio

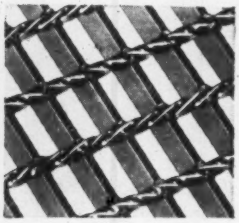
CIRCLE 137 ON READER SERVICE CARD

EXTRA SAFETY UNDERFOOT
on this Cement Plant Stairway
with

KERRIGAN

Weldforged
TRADEMARK
OPEN STEEL TREADS

TWISTED Cross Bars *ALTERNATE* right and left



When you specify Kerrigan Weldforged grating you get the utmost in underfoot and underwheel safety . . . in addition to its well known economy features. Bearing bars, and cross bars that alternate right and left, are electronically weldforged into inseparable, one-piece units that stand up under the severest kind of punishment.

Get the engineering facts! Write now for FREE catalog. Address: Dep't E-11.

KERRIGAN
IRON WORKS COMPANY
Nashville, Tennessee

Books

Karl Terzaghi

Lessons in Soil Mechanics

FROM THEORY TO PRACTICE IN SOIL MECHANICS: Selections from the writings of Karl Terzaghi—425 pp. John Wiley & Sons, Inc., New York. $12.

By F. E. Schmitt

Thirty-four years ago ENR introduced to engineers a series of new findings on the physical action of earth materials, with primary application to construction. Its author was an obscure teacher in a small American college in Turkey—Karl Terzaghi.

At about the same time, Mr. Terzaghi came to this country in person, on an invitation to teach at Massachusetts Institute of Technology. There he not only resumed his pursuit of earth research on expanded scale but found early an increasing opportunity to apply and study the practical use of its results by responding to calls for assistance on earth construction jobs.

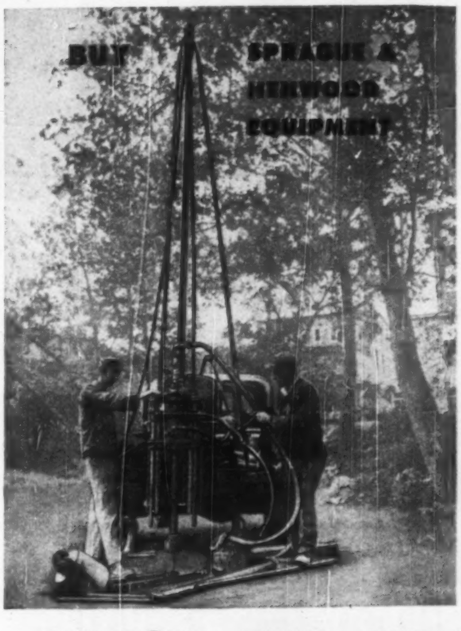
An early instance of such assistance was a full-scale measurement of retaining-wall pressure, which he carried out in connection with the design of a New England dam. From this early entrance into our technical literature the name Terzaghi rapidly grew to wide note and progressively to dominating position in the study of earth materials and earthwork engineering.

In such manner the new science and art of Soil Mechanics came into being. Its inherent scientific importance added

---

Mr. Schmitt, retired former editor of ENR, was instrumental in introducing Karl Terzaghi and his early writings to U. S. engineers.

SPECIFY...
DRILLING EQUIPMENT
WITH
BUILT-IN
QUALITY-DEPENDABILITY



YOU'LL END UP WITH THE PROFITS YOU'VE LOOKED FOR

Yes, you can buy ordinary drilling equipment and you'll probably save money . . . but in a short time the efficiency of the machine will drop, the rods will be worn and bent, the waterswivels will leak, the casing will be broken, the dependability you counted on will not be there. Instead, you'll be required to spend large amounts of money bringing comparatively new equipment back up to par.

If you are looking for drilling machinery and equipment that is built for Quality . . . not for Price, specify and purchase SPRAGUE & HENWOOD: dependable . . . efficient . . . proven in the field.

Write, giving full particulars on your problem, and the correct brochure or catalog will be sent to you immediately.

Look for our emblem... It's your Seal of Quality

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CIRCLE 139 ON READER SERVICE CARD

to its extensive bearing on earthwork engineering gave it instant recognition in practice as well as in the schools, and attracted earnest students as disciples and fellow-researchers. As rapidly as disciples could be trained, Soil Mechanics found a home also at other engineering schools, and received recognition in all major fields of earth construction and service – foundations, earth dams, highways and others.

Both in research and in practical application, Soil Mechanics has prospered through the activities of its disciples. Its ramifying problems brought about an ever-increasing range of research, both in laboratory and in the field of practice. The subject attained a scope and volume in which few others than specialists are at home. No less extensive is the range of field conditions and problems that call for aid from the field of Soil Mechanics. Throughout the years, Terzaghi has remained its guiding spirit and acknowledged leader.

This book is about Karl Terzaghi. It is both a history and a condensed specimen record of his methods in investigating and solving engineering problems in the field. No civil engineer can afford to dispense with the inspiration of his professional history or the demonstration of his methods of dealing with complex engineering problems.

Terzaghi's life history as set down in a biographical chapter of this book by Arthur Casagrande, one of his earliest students and disciples and his leading colleague, is an intimate, sensitively traced story picture of the master's development and progress, of a life directed throughout by a single aim—to learn more of the nature and complexities of the earth material on which we walk and build, and to overcome the difficulties it presents to us. This singleness of purpose combined with a number of vital qualities to carry him consistently forward: remarkable power of observation and equal ability to synthesize and interpret the observed details; comprehensive grasp of whatever situation presented itself; precise judgment devoid of bias or passion; a memory that has little need for notes and sketches; and, perhaps most important, indefatigable industry, which spares no pains in recording the observed scene and detail or in studying any and all feasible solutions. This biographical chapter is must reading for every civil engineer student and young engineer.

The workings of Terzaghi's active and inquiring mind are reflected in his own description on one occasion: That in each new problem, after first seeking out and putting together all available

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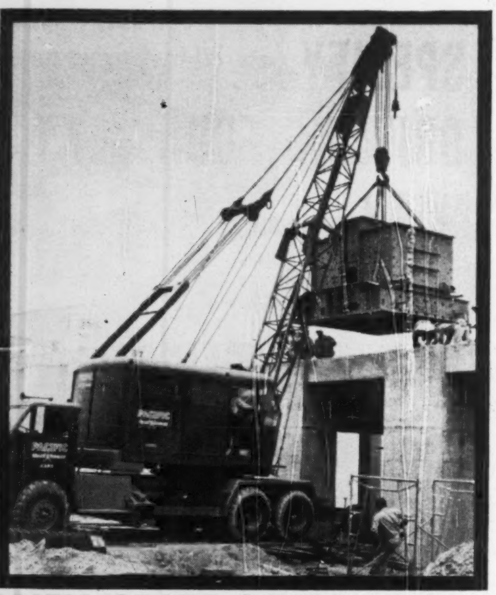

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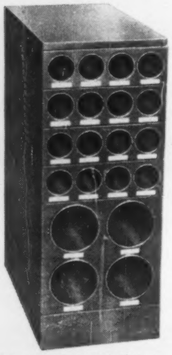

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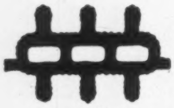

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or discoverable facts of the case, he usually finds himself in complete confusion of thought, unable to see the way out, until by dint of repeated going over the facts and comparing possible remedies or solutions he discerns, bit by bit, the path toward a feasible solution; ultimately, through further concentration on this initial pathway, the obviously right solution emerges.

The larger part of this noteworthy book is devoted to a series of Terzaghi's reports on field problems—outstandingly valuable material, both because of the organization of the individual report in hand and because of what the reader may be able to discern of the method of approach to the solution of the particular problem in hand. These reports are in the highest degree instructive if the reader is able and willing to discover and follow the course of analysis and reasoning by which the master reached his findings and recommendations. Here is study material of first quality. The five "Selected Professional Reports," covering some 120 pages, form a library of model engineering analysis that every student and young engineer, and many an older engineer as well, will find both instructive and educational.

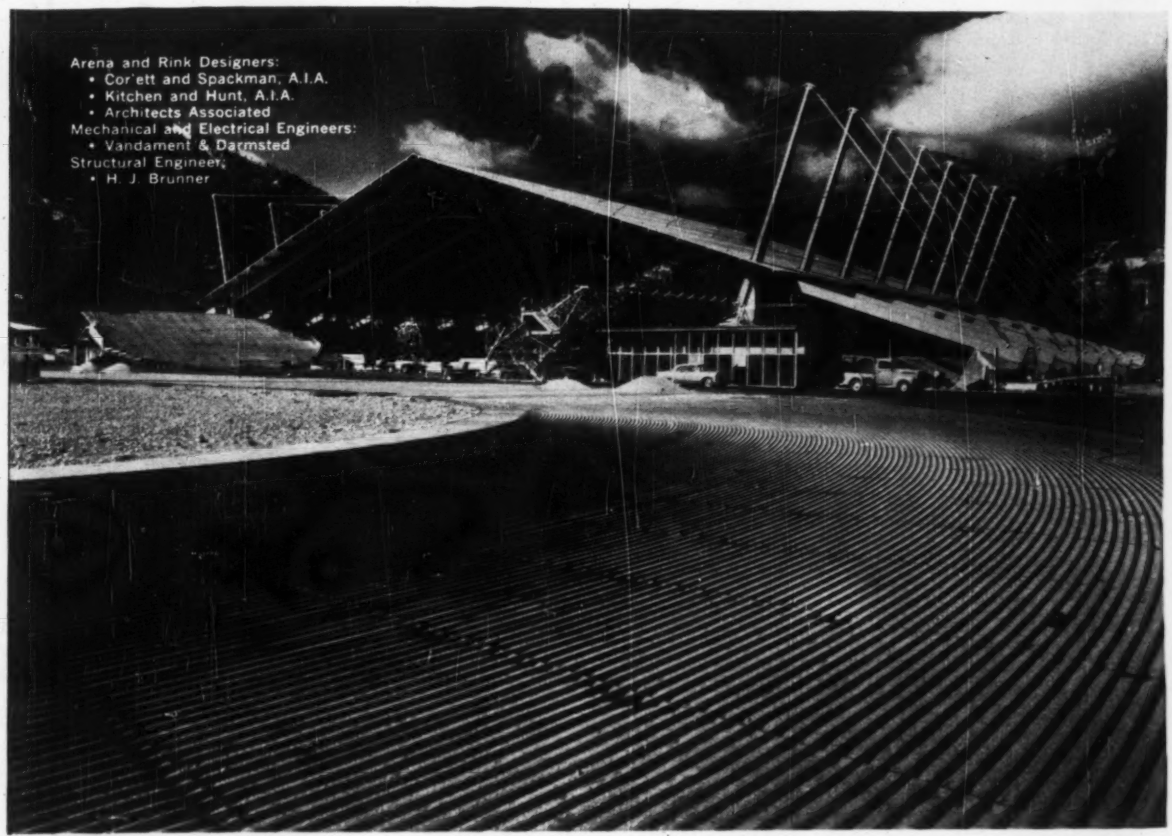
To close these remarks: A debt of gratitude is owing to the authors and compilers of the book for their devoted, painstaking work, which clearly was a labor of love. They have brought together and saved for posterity a significant and enlightening record, a well-deserved honor to a great man and engineer.

Just Published . . .

FLOODS OF JANUARY-FEBRUARY 1959 IN OHIO—A 54-page Geological Survey Circular 418 is by W. P. Cross and H. P. Brooks. Prepared in cooperation with the Ohio Department of Natural Resources, the Ohio Department of Highways, the Miami Conservancy District, the city of Columbus, and the Corps of Engineers. U. S. Geological Survey, Washington 25, D. C. Free.

ODELL QUADRANGLE TOPOGRAPHIC MAP—First complete topographic map of the State of Illinois. Illinois State Geological Survey at Urbana or U. S. Geological Survey, Washington, D. C. 30 cents.

MANUAL ON ECONOMIC DEVELOPMENT PROJECTS—242 pages. United Nations, New York, N. Y. $3.00 Compilation of data that will enable an appraisal of economic advantages and disadvantages attendant upon allocation of a country's resources to the production of specific goods and services. Study treats mainly of Latin America, but illustrative examples and approach to problem could be applicable in any locale.



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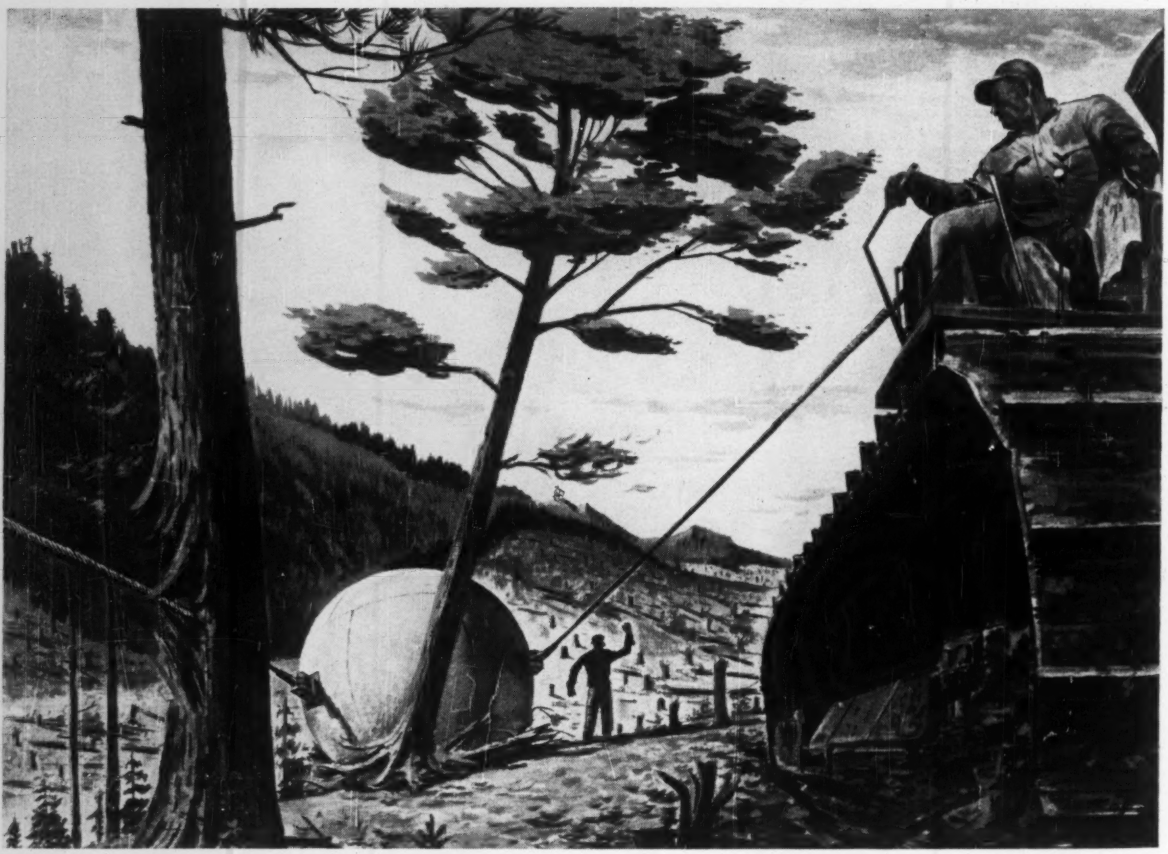

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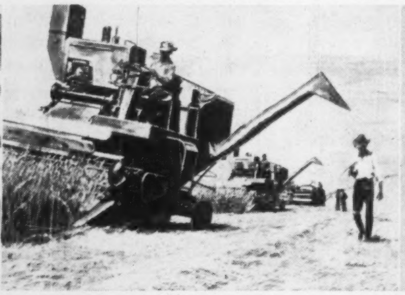

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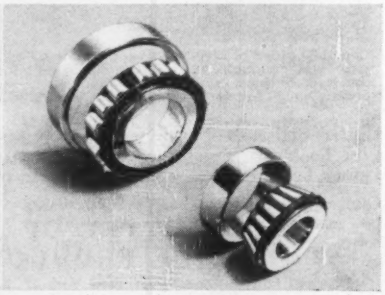


Legal

Amount Due a Contractor Limits Recovery on Lien

The lien of a subcontractor is restricted to the amount due and unpaid to the general contractor.

The law was discussed by a New York court in a case involving foreclosure of mechanic's liens. Action on one lien was dismissed because the subcontractor had not performed the work in a good and workmanlike manner. Foreclosure of another lien was granted but was limited to the amount due the general contractor.[1]

The court stated: "The liens of the masonry and plastering subcontractors against the owner rest upon the theory of subrogation to the rights of the general contractor (Szemko v. Weiner, 176 App. Div. 620, 163 N.Y.S. 382). A subcontractor is restricted in his claim to satisfaction out of whatever amount, if any, is due and unpaid from the owner to the general contractor. Soll v. Camardella, 277 App. Div. 1004, 100 N.Y.S. 2d 187. He has the burden of proving that, at the time of filing his lien, a sum was due to the general contractor or thereafter became due to him, to which his subcontractor's lien could attach. Brainard v. Kings County, 155 N.Y. 538, 50 N.E. 263. He is under the same obligation to prove performance and to the same extent that the general contractor would be."

(1) Klinick v. 66 East 80 Corp., 185 N.Y.S. 2d 1009, N.Y. Supreme Court, Jan. 19, 1959.

Court Upholds the Right To Arbitrate a Dispute

A New York court has ruled that a dispute over extra work is one of the types of disagreement covered by a general arbitration clause.

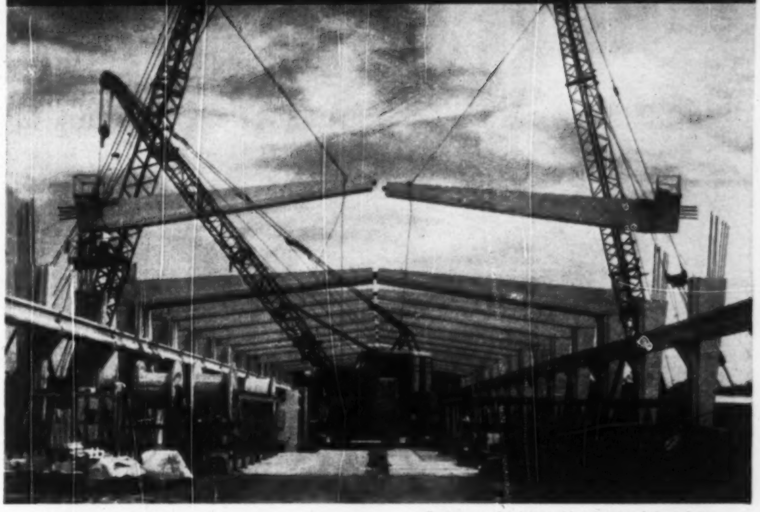
A contractor brought an action to recover for alleged extra work performed under the contract. The owner instituted a proceeding to compel arbitration of the dispute and his application was granted.[1]

The contract provided that "any disagreement arising out of this agreement or from a breach thereof, shall promptly be submitted to arbitrators selected as hereinafter provided; and the decision of the arbitrators shall be a condition precedent to any right or legal action that either party may have against the other, arising out of this agreement."

The owner claimed that the amount sued for was not extra work but arose

(Continued on p. 148)

STRESSTEEL was the solution to this Engineering Problem



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Owners: San Vel Concrete Corporation, Littleton, Mass.

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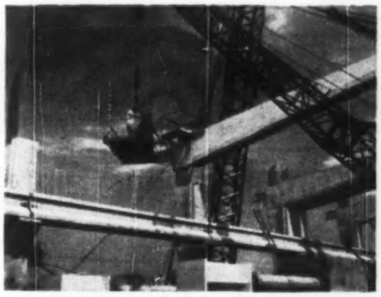

The roof girder is in two equal sections, hinged at the midpoint. The STRESSTEEL Bars in the columns extend through the ends of the roof girders and are tensioned to form an integral unit. The columns rest on footings over cast-in keys to create hinge effect.

The roof is composed of prestressed pretensioned double tee sections, which rest on the flanges of the inverted-T of the roof girder. Wall sections between columns, composed of 4" precast insulated wall panels, complete the building.

A projection is cast as part of the column to support the crane-ways for the two overhead cranes. A pretensioned I-beam rests upon them, to which the crane rails are attached.

Imaginative engineers are using STRESSTEEL Bars as the effective solution to many precast concrete problems. These high strength alloy steel bars are available in sizes up to 1¼" ∅ with recommended working stress up to 90,000 psi. Equipped with wedge or threaded anchors, STRESSTEEL Bars have been used for many unusual and special applications.

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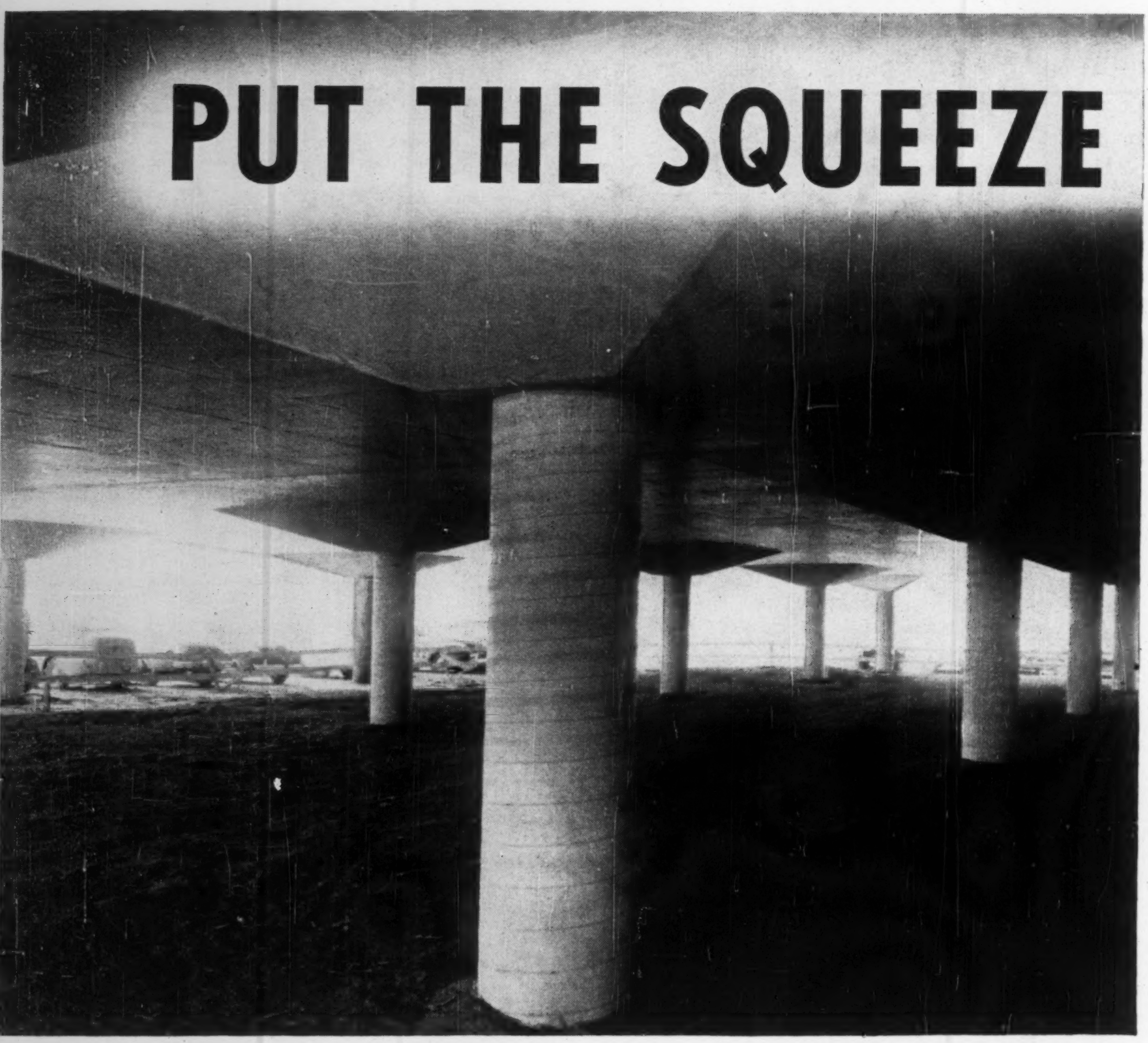

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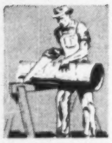
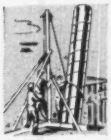
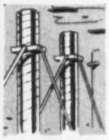

Can be sawed to size on the job


Place by conventional means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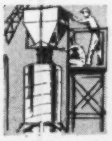
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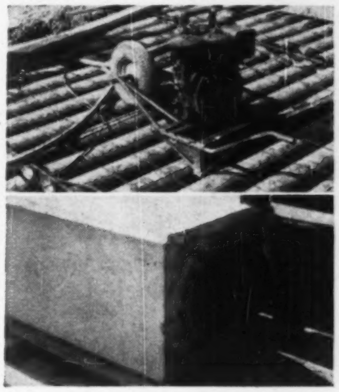

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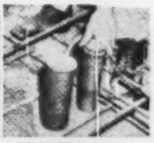

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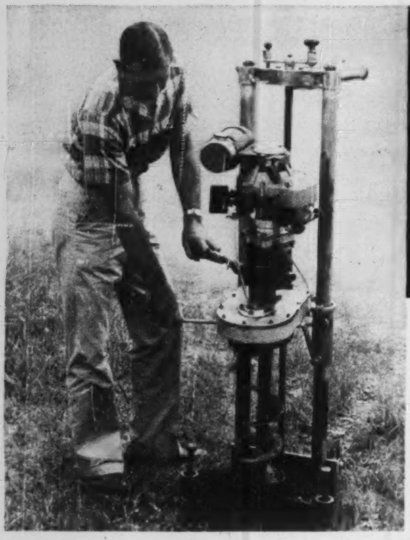

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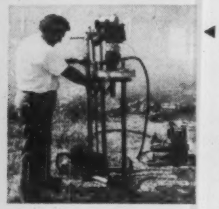

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out of the contract. The court held, that under the terms of the contract, the matter was subject to arbitration even though it was extra work. The court, quoting from Young v. Crescent Development Co., 240 N.Y. 244, 148 N.E. 510, stated: "The arbitration clause provides for the submission of 'all questions that may arise under this contract and in the performance of the work thereunder.' We know by common experience the class of questions to which this language naturally applies. It applies as stated to questions arising under and in the performance of a contract and such questions are those which involve an interpretation of its provisions for the purpose of determining whether work has been done according to the contract, whether work which has been demanded under the contract is really covered by its provisions or constitutes extra work, when payments become due, and so on. All of these questions involve recognition of the contract and not repudiation of it."

(1) Siegfried v. Katz, 190 N.Y.S. 2d 126, N.Y. Oneida County Court, March 20, 1959.

An Owner Need Not Pay For Improper Performance

A contractor who has deliberately violated his contract is not entitled to any compensation for the work he has performed.

That is the ruling of a Massachusetts court in the following case:

An owner of a building employed a plumbing contractor to install new equipment in a building for an agreed price of $4,315.

Thereafter, the contractor made false representations as to the character of the work to be performed and induced the owner to sign a note and mortgage for $6,300 for the work to be done. After the contractor had performed the work, the owner learned that the representations made to him to induce him to sign the note and mortgage had been false, that the work had been improperly performed, and that the contractor had deliberately varied from the work called for by the contract.

An action was brought to determine the rights of the parties, the contractor seeking to recover the contract price less payments on account made to him and the owner seeking to nullify the note and mortgage.

The court[1] ruled in favor of the owner, holding that since the work done by the contractor was improper and because there were deliberate varia-

(Continued on p. 150)

AMERICAN BRIDGE DOUBLE DECKS CLYDE HOISTS ON BARGE MOUNTED TOWER DERRICK

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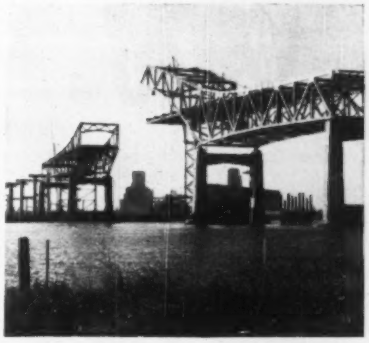


American Bridge Division, United States Steel Corporation has a 165 foot, barge-mounted tower derrick to set steel on the center span of the new high bridge at Duluth-Superior, western terminal of the St. Lawrence Seaway. Two Clyde Hoists were used, one to operate the derrick and one to position the barge.

CLYDE IRON WORKS, Inc.

Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS

CLYDE

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

NOW! GET FULL-POWER FIRE FIGHTING WITH KIDDE'S DRY CHEMICAL LINE!

Kidde
REMOVE HORN PULL TRIGGER
REMOVE HORN PULL TRIGGER

2½ and 5 pound pressurized units! Granted top rating by U.L., these two units pack the extra punch needed to get the jump on fire. For example, the 2½ pound Kidde unit is as compact as a 1 quart carbon tet model, yet is eight times as powerful! Both the 2½ and 5 feature simple, two-step operation, easy-to-read dust-and-moisture-proof gauges. 10 pound dry chemical also available.

20 and 30 pound pressurized dry chemicals! Both these Kidde units have the same good features of the 2½ and 5, plus some "extras" all their own. Center balanced for fast action, rugged diffuser horn, speedy trigger operation, recessed pressure gauge and enclosed mechanism.

200 pound dry chemical wheeled unit! Kidde's 200 pounder discharges a 40-foot stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. Low center of gravity and wide wheels make it easy to maneuver. Easy-to-use discharge control makes operation simple.

400 pound stationary unit! Here's maximum protection in a minimum package! Like all Kidde units, this features sure, dependable performance and fast, easy operation. Either wall-mounted or free standing, leakproof and tamperproof, exclusive Bridgeman Seal, universal long-range nozzle, easy-to-read pressure gauge. 200 pound model also available.

Get the jump on oil, gas and electrical fires! Learn more about the complete line of dependable, efficient Kidde equipment—write today!

Industrial and Marine Division
Walter Kidde & Company, Inc.
1244A Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

Kidde

tions from what was called for by the contract, the contractor was not entitled to the contract price or to payment for his work and that the owner owed the contractor nothing.

(1) Finn v. Romanos, 163 N.E. 2d 926, Supreme Judicial Court of Massachusetts, December 11, 1959.

Courts Try to Follow Intention of Parties

A contract should be so construed as to give effect to the intent of the contracting parties, and the contract must be construed in its entirety in order to determine what that intent is.

In explaining these fundamental rules of contract construction, an Illinois court had this to say:

"It is well established in the law of contracts that an agreement must be construed in its entirety in order to ascertain the intention of the parties thereto, and where under the terms of a contract it is subject to two different interpretations, that interpretation will be adopted which gives to the contract some operative effect rather than that which renders it inoperative. Minnesota Lumber Co. v. Whitebreast Coal Co., 160 Ill. 85, 43 N.E. 774, 31 L.R.A. 529; Torrence v. Shedd, 156 Ill. 194, 41 N.E. 171. In the Torrence case, the court said: at pages 211-212, of 156 Ill., at page 100, of 41 N.E.: 'A contract should be construed in such a way as to make the obligations imposed by its terms mutually binding upon the parties, unless such construction is wholly negatived by the language used. Bish. Cont., Section 417; Bangor Furnace Co. v. Magill, 108 Ill. 656. Courts will seek to discover and give effect to the intention of the parties, so that performance of the contract may be enforced according to the sense in which they mutually understood it at the time it was made; and greater regard is to be had to their clear intent than to any particular words which they may have used to express it.'"[1]

(1) Trompeter Construction Co. v. Higby, 161 N.E. 2d 159, Appellate Court of Illinois, April 29, 1959.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers; and Legal Cases for Contractors, Architects and Engineers.*

22 DAYS AHEAD OF SCHEDULE!

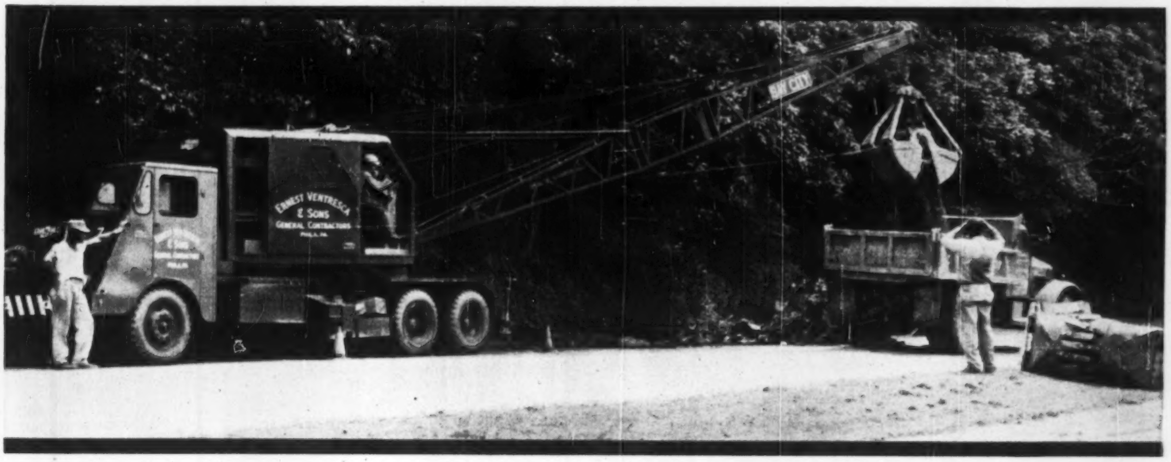
CRANEMOBILE®

COMPLETES JOB IN 45% OF WORKING DAYS ALLOWED

When Ernest Ventresca & Sons, Inc., Philadelphia, was awarded a contract for improving an existing storm drainage system in that city, the company was given 40 working days to complete the job. It included the installation of short pipe runs at regular intervals — 2,000 feet of 15 and 18 inch concrete pipe were laid all told — in open ditch and tunnels along a four-mile stretch of East River Drive, the city's main traffic route along the Schuylkill River.

Ventresca & Sons used a **BAY CITY** 25-ton CraneMobile to dig ditch, set pipe, and handle backfilling. Despite poor weather and traffic congestion (the drive remained "open" 90% of the time), the entire project was completed almost a month ahead of schedule. Mr. Ventresca has this to say about **BAY CITY:** "Performance is a must in my work — I get it with a **BAY CITY.** That's why I'll go **BAY CITY** again."

CraneMobile features are "performance-proved" not only on "bread and butter" earthmoving jobs like this but on high, heavy lifts and long boom work as well. Accurate setting of high steel or precise spotting of concrete beams is constantly assured by CraneMobile controlled lowering under power. Precise control at all boom angles is provided by the CraneMobile power-controlled independent boom hoist. The boom alone, or boom and load, can be raised or lowered simultaneously with any other operation. The hi-collapsible gantry, pin-connected boom and jib, demountable counterweight, and removable outrigger assembly permit rapid strip-down for between-job moves.



CraneMobiles are available in 25-, 30-, 35-, and 40-ton sizes, mounted on specially designed BAY CITY-built 6 x 4 or 8 x 4 carriers. For details and the name of your nearest dealer, write today.

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BAY CITY, MICHIGAN

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PORTABLE DREDGES

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How do you choose your subcontractor for fencing and guard rail when the bids are close? Naturally, you look at the intangibles—the kind of plus factors that often make a big difference in your profit on the *finished job*. With Anchor it's a point of pride to be able to offer more than just top-quality materials. In back of every Anchor bid is over 68 years of experience on jobs in every corner of the country. Anchor maintains 44 regional offices, ready to give you on-the-spot technical help and prompt erecting service. There's an office near you. Why not give them a call? And for more data on all Anchor safety devices, write:

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Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Mass., Monson—BA 12/28—Commonwealth Mass., Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, M-58-8 Contr. 1, imprv. sewer disposal, State Hospital. $88,000. Utility Engineers, Inc., 79 Cambridge St., Boston, Mass., engr. CD 1/9/59.

BUILDINGS—BA

Vt., Winooski — DORMITORY — BA 1/5 — St. Michael's College, 56 College Parkway, PROJ: CH VT.-14 (B) men's dormitory. $500,000. Plans deposit $50. Freeman, French & Freeman, 158 Bank St., Burlington, archts. Severud, Elstad, Krueger Assoc., 415 Lexington Ave., New York, N. Y., engrs. CD 11/30.

▲ **Conn., Storrs**—DORMITORY—BA 1/11—State Pub. Wks. Comr., 165 Capitol Ave., Hartford, Proj. BI-D-211B, South Dormitory University of Connecticut, $2,700,000. Plans deposit $45. CD 10/31/56.

BUILDINGS—SLC

Mass., Ashland—CHURCH—St. Cecilia R. C. Parish, c/o Chancery, 1 Lake St., Brighton, soon lets contract church, $400,000. W. Chester Browne & Assoc., Inc., 122 Arlington St., Boston, archt. CD 12/31/59.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 12/6,
Mass.—**Macon Constr. & Engineering Co., Inc.**, 32 Winthrop Dr., Attleboro, Mass., LB **$232,495**, est. $287,891 (23 bidders), hy. and bridge work, Rte. 122, Northbridge and Uxbridge;
Mass.—**Bruschi Bros., Inc.**, East St., Ludlow, Mass., LB **$152,351**, est. $156,351, Chapter 90, hy. work, Chestnut and Springfield Sts., Springfield. CD 11/23.

C. Di Martine & Sons, Inc., 513 Lincoln St., Franklin, Mass., CA **$118,662**, est. $100,000, sewer and water mains, GARDNER, MASS. City, Water Office, City Hall, Gardner, Mass. Bids Dec. 5, awarded Dec. 6. CD 11/30.

BUILDINGS—LB & CA

A. Taylor Corp., 74 S. State St., Concord, N. H., CA **$800,000**, BOWLADROME, S. Daniel Webster Highway at Danforth Rd., NASHUA, N. H. C.D.T. Corp., 17 Wilson Ave., Concord, N. H.

L. D. Phillips Constr. Co., Inc., 8 Main St., Westfield, Mass., LB **$482,242**, est. $400,000, HOUSING FOR THE ELDERLY, North Westfield St., Proj. 667-1, AGAWAM, MASS. Town Housing Auth., 36 Main St., Agawam, Mass. M. Menkus, 22 Maplewood Terrace, Springfield, Mass., mech. engr. Bids Dec. 5. CD 11/9.

Henry M. Soule Co., 421 Walcott St., Pawtucket, R. I., LB Est. **$400,000**, Shopper's WORLD SUPERMARKET, FRAMINGHAM, MASS. Owner, c/o Stop & Shop, Inc., lessee, 393 D St., South Boston, Mass. Bids Nov. 15. CD 11/10.

Canter Constr. Co., 185 Corey Rd., Brookline, Mass., LB **$828,000**, est. $820,000, (25 bidders), BANK, 1180 Centre St., NEWTON CENTER, MASS. Newton Savings Bank, 286 Washington St., Newton, Mass. Bastile-Halsey Assoc., 120 Tremont St., Boston, Mass., archts. Cleverdon, Varney & Pike, 120 Tremont St., Boston, Mass., engrs. Bids Dec. 9. CD 11/18, under Mass., Newton.

▲ **South County Hospital**, 95 Kenyon Ave., Wakefield, R. I., rejected bids Nov. 17, hospital wing, WAKEFIELD, R. I. **$1,150,000.** CD 11/14.

S. Carpenter Constr. Co., 45 Gaylord St., Bristol, Conn., CA **$571,544**, ELEMENTARY SCHOOL, King St.-W. Washington St. area, BRISTOL, CONN. Town, Bd. Educ., P.O. Box 1601, Bristol, Conn. Bids Nov. 21, awarded Dec. 7. CD 11/28, under LB.

Dwight Bldg. Co., 109 Sanford St., Hamden, Conn., CA **$552,000**, expand FARNAM OPERATING SUITE, consolidate LABORATORY SPACE, reconstruct diagnostic radiology area, for Chemotherapy and Cardiac Programs, Charles A. Dana Operating Pavilion, NEW HAVEN, CONN. Grace-New Haven Community Hospital, 789 Howard Ave., New Haven, Conn. Bids Oct. 18, awarded Dec. 6. CD 10-21, under LB.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. J., Mount Holly**—SCHOOL—BA 12/28—Bd. Educ. Jacksonville Rd., constr. Junior High School. $1,368,400. Plans deposit $25. Micklewright & Mountford, 90 E. Stuyvesant St., Trenton, archts. CD 10/25.

† **N. Y., New York**—MEDICAL UNIT—BA 12/28—General Service Admin., 250 Hudson St., Zone 13, medical unit, Federal Office Bldg., 90 Church St.

† **N. Y., New York**—BUILDING NO. 1 ALTERATIONS—BA 1/11—Veterans Admin., Munitions Bldg., Wash., D. C., alterations, Bldg. No. 1, Veterans Admin. Hospital, for Animal Research Laboratory, Proj. No. 31-5591 Spec. No. 6044. Extended date. CD 10/24.

▲ **Md., Glen Burnie**—MOTOR VEHICLES BLDG.—BA 1/5—State, Dpt. P. Imprvts., 301 W. Preston St., Baltimore, Zone 1, 2 story, bsmnt., masonry, concrete, concrete block, steel motor vehicle headquarters, Ritchie Hy. and Furnance Branch. $3,500,000. Plans deposit $100. Fletcher Fletcher, 2117 N. Charles St., Baltimore 18, Md., archt. Rummel, Klepper & Kahl, 1021 N. Calvert St., Baltimore 2, Md., engrs. CD 1/7.

† **N. Y., Brookhaven**—STEAM PLANT IMPRVTS., etc.—BA On Or About 1/10—Atomic Energy Comn., Brookhaven Area Office, Engineering & Constr. Branch, 53 Bell Ave., Brookhaven National Laboratory, Upton, Inv. No. NY-22-61, mechanical, electrical and misc. work for Steam Plant extension, Brookhaven National Laboratory. Gibbs & Hill, Inc., 461 Eighth Ave., New York 1, N. Y., archt.-engr.

† **N. Y., Brookhaven**—SITE UTILITIES, etc.—BA On Or About 1/10—Atomic Energy Comn., Brookhaven Area Office, Engineering & Constr. Branch, 53 Bell Ave., Brookhaven National Laboratory, Upton, Inv. No. NY-23-61, constr. site utilities (underground steam distr. addns.) at Brookhaven National Laboratory. Plans deposit $25. Gibbs & Hill, Inc., 461 Eighth Ave., New York, Zone 1, archt.-engr. CD 10/26/55.

▲ **N. Y., Huntington**—CONVENT, etc.—BA 1/11—Diocesan Bldg. Comn., 253 Sunrise Hy., Rockville Centre, convent, chapel and school for Girls, Madonna Heights. $1,500,000. John H. Clark, 85 Market St., Poughkeepsie, archt.

N. J., Toms River—JAIL ADDN.—BA 2/1—Bd. Freeholders Ocean Co., Court House, 3 story, bsmnt. jail addn., east side of present bldg. $850,000. Kelly & Gruzen, 10 Columbus Circle, Rm. 2220, New York 19, N. Y., archts. Harwood & Gould, 233 W. 42 St., New York 36, N. Y., structural engrs. Runyon & Carey, 20 Fulton St., Newark, N. J., mechanical engrs. CD 6/13.

(Continued on page 156)

CONTRACTORS...
Manitowoc
SECTIONAL BARGES
fit any job, can
be shipped over the highway

Manitowoc Sectional Barges provide a solid support for all construction jobs involving work on or near a body of water. There is no limit to the variety or arrangements possible with the barge sections. Two different basic pontoon sizes add to the working flexibility under any combination of circumstances.

The barges can be used as a dependable floating platform for power cranes and other construction equipment; fitted with hoppers for transport of bulk materials; as temporary bridging; and many other diversified uses.

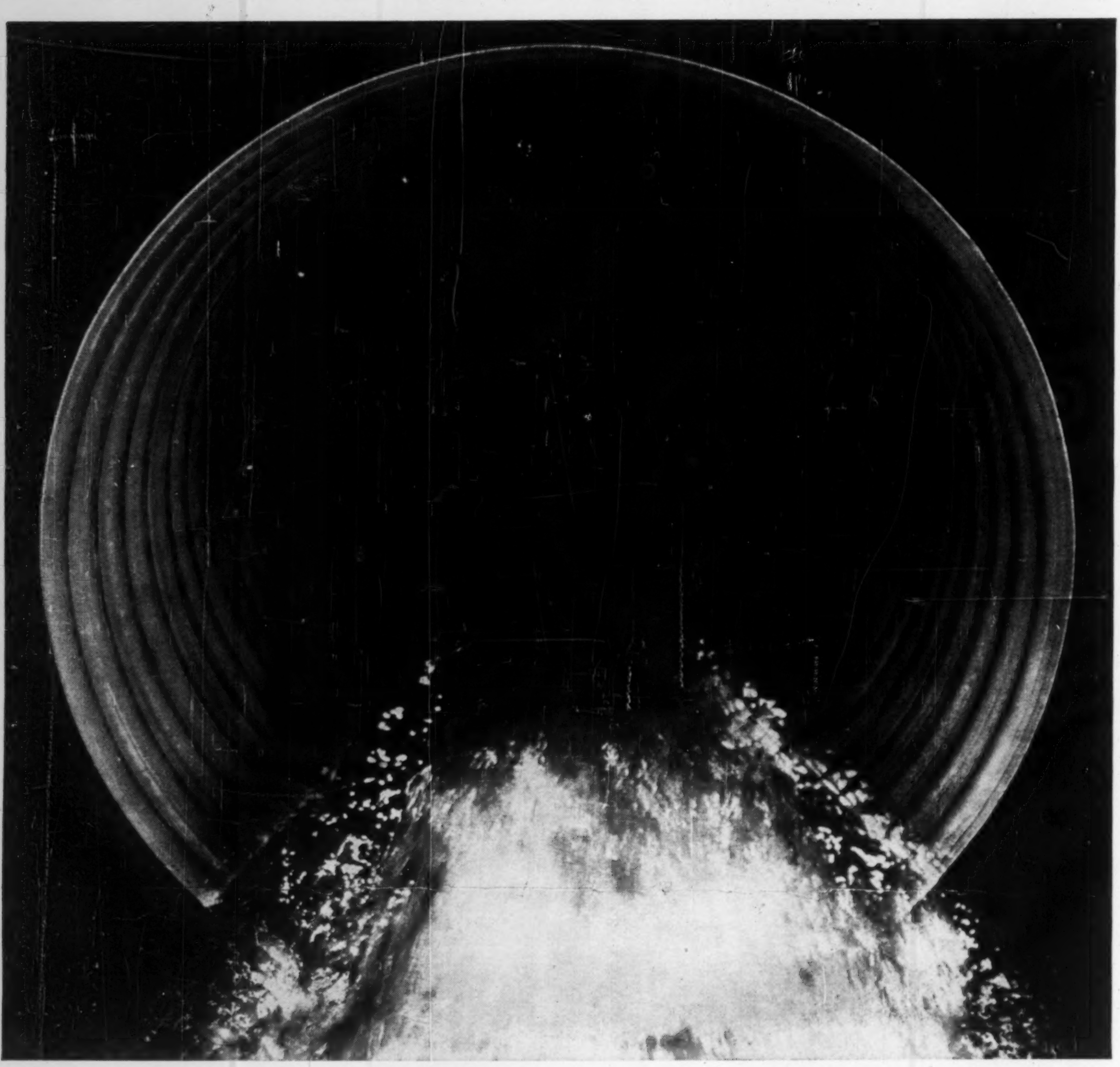
Because the pontoons are easily bolted together and quickly disassembled, fast moves between jobs are possible. Sections can be shipped on flat-bed trailer or standard railway flatcar.

Send for literature covering Manitowoc Sectional Barges or contact your nearest authorized Manitowoc distributor and see for yourself how they can save money on many construction jobs.

MANITOWOC ENGINEERING CORP.
(A Subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

CIRCLE 153 ON READER SERVICE CARD

NEW!! CULVERT OF



Strong protection against pipe failure!

Kaiser Aluminum & Chemical Sales, Inc.
Culvert Dept. Room 846, Kaiser Center
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Send me a copy of "Aluminum Culverts—Technical Information"—containing availabilities, uses, installation . . . suggested specifications.

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Last year the first *all-aluminum corrugated culvert pipe* came into use in modern roads and highways!

The reason: the success of new Kaiser Aluminum Culvert Sheet—a special high-strength clad alloy based on ten years of severest soil corrosion testing.

The corrosion resistance of this new aluminum pipe is as thick as the metal itself. It is not endangered by everyday scrapes and runoff abrasion—conditions that chip off a galvanized coating and expose bare steel to rusting out. For any culvert load, fill limit, or safety factor you have normally specified for steel, there is now an aluminum pipe strength to meet your requirements. Independent tests show comparable installed pipe performance.

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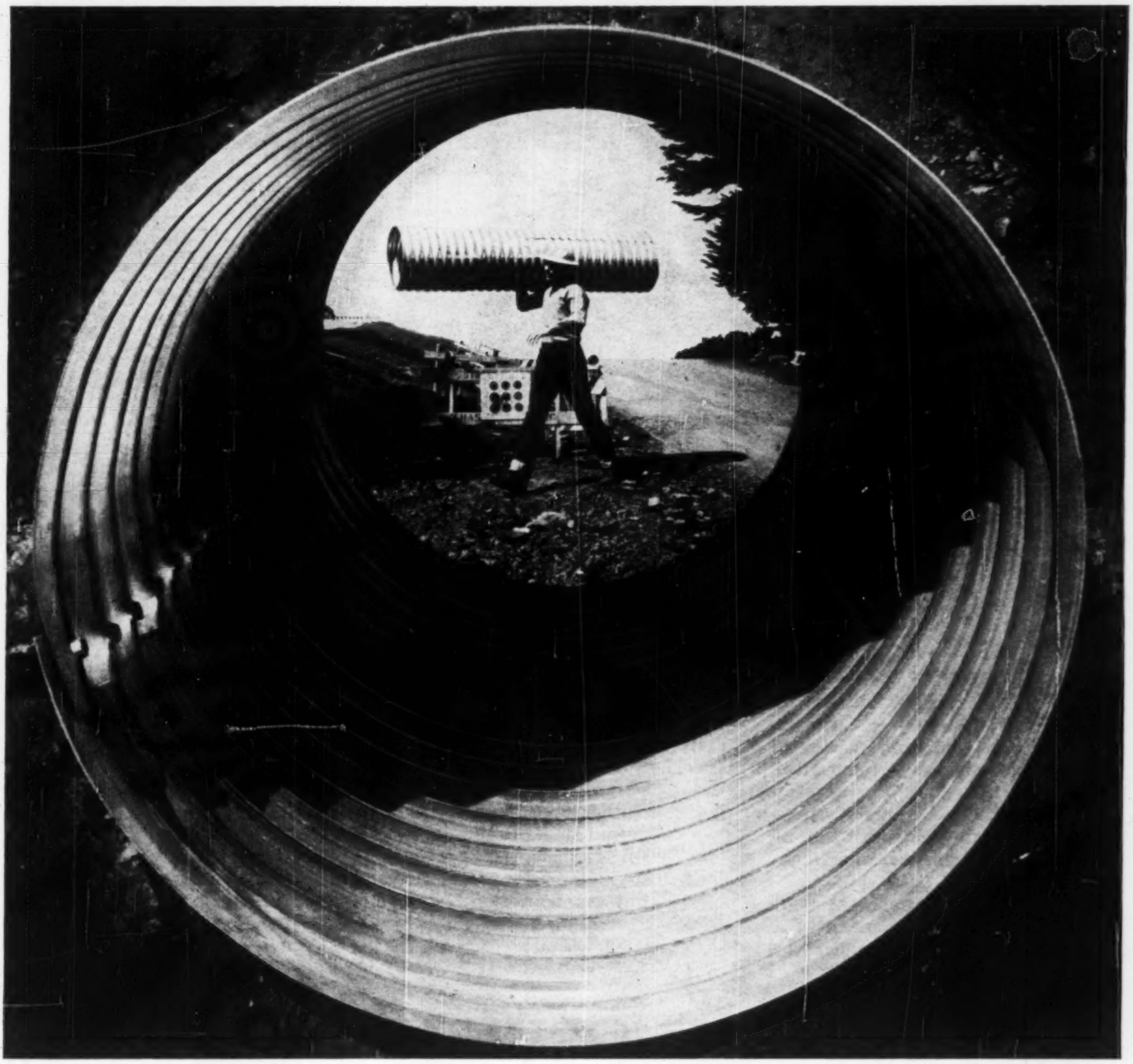

Saves up to 20% in total job cost!

Since early 1960, contractors have reported savings up to 20% in total job cost because of the lower handling and installation costs of aluminum culvert.

Aluminum pipe *weighs less than one-third* as much as steel—160 pounds against 500 pounds in a typical 20′ x 24″ section.

This means that winch equipment is seldom needed for lifting. Aluminum pipe is loaded and positioned by hand, sawed to size almost like wood, and easily connected. A typical crew can install about 20% more of this new culvert per day.

For availability and complete technical information, use the coupon at left . . . or contact your nearest Kaiser Aluminum Sales Office listed in your telephone directory.

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New leadership in the world of aluminum

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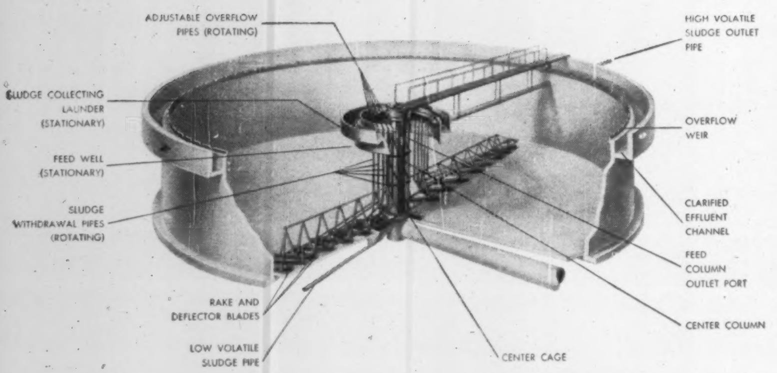
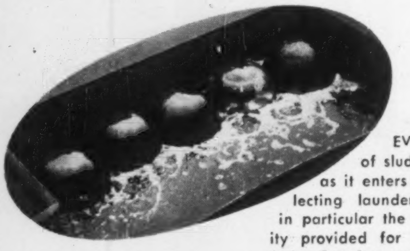

ADJUSTABLE OVERFLOW PIPES (ROTATING)
SLUDGE COLLECTING LAUNDER (STATIONARY)
FEED WELL (STATIONARY)
SLUDGE WITHDRAWAL PIPES (ROTATING)
RAKE AND DEFLECTOR BLADES
LOW VOLATILE SLUDGE PIPE
CENTER CAGE
HIGH VOLATILE SLUDGE OUTLET PIPE
OVERFLOW WEIR
CLARIFIED EFFLUENT CHANNEL
FEED COLUMN OUTLET PORT
CENTER COLUMN

3-WAY CAPABILITY of the RSR Clarifier to make high-volatile sludge, low-volatile sludge and clarified effluent separation is illustrated in the cutaway drawing.



VISUAL EVIDENCE of sludge flow as it enters the collecting launder. Note in particular the flexibility provided for varying sludge flow from each individual uptake pipe.

NOW . . . *Rapid, continuous sludge removal with the new* **DORR RSR CLARIFIER**

For rapid removal of fresh sludge on a continuous basis, the Dorr® RSR Clarifier affords visual evidence of quality and quantity of sludge removed from secondary clarifiers. This is accomplished by removal of sludge from the entire floor area by rotating uptake pipes. Simple adjustment provides for controlled rate of sludge removal from each individual pipe.

In operation, a combination of rake and deflector blades channel the fresh sludge to an area under the withdrawal pipes where the sludge is lifted by hydraulic head to the collecting launder. Sludge flows from the launder to a sump for recycling or wasting following conventional practice. The sweeping action of the rake blades also provides for removal of grit and other inorganic material *without* dewatering the tank.

For information on the RSR Clarifier and on the complete line of Dorr-Oliver equipment and methods for sewage treatment, write Dorr-Oliver Incorporated, Stamford, Conn.

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PORT-O-DRILL . . . use anywhere!

- Portable
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- Heavy Duty
- Lightweight
- Operates in any position

Powered by self-contained 2.2 HP, 2 cycle, air cooled gasoline engine with constant pressure fuel flow.

Port-O-Drill has 3-speed transmission with selector lever for High-1400 RPM, Med.-600 RPM, and Low-325 RPM. Wet, cone type friction clutch is engaged by operator pressure and automatically releases when pressure is withdrawn. Locking collar allows positive clutch engagement for work clean out.

Proven in service with drills as small as ¼" in steel and up to 6" in diamond core drilling and dirt augering.

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PORT-O-DRILL

$237.00 List Price

F.O.B. Factory

(Continued from page 153)

HEAVY CONSTRUCTION—LB & CA

NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany, bids opened 12/9,

The Callanan Rd. Imp. Co., S. Bethlehem, N. Y. LB **$668,100**, est $828,000, (2 bidders), b. conc. twin 15 ft. open box 4.41 mi. Greenville-Coxsackie, Pt. 2, SH 719, Greenville-Coxsackie, Pt. 3, SH 1365, Rte. 81, R.C. 60-186, Greene Co. CD 11/1.

NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany, bids opened 12/9,

Gibson & Cushman Inc., 38 Homan Ave., Bay Shore, N. Y. LB **$439,300**, est. $668,500, (5 bidders), highway slope protection 3.83 mi. Ocean Parkway (Tobay Beach to Gilgo State Park) OP 60-1, Nassau and Suffolk Counties. CD 11/15.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, bids opened 12/9,

N. Y.—**The Callanan Rd. Imp. Co.**, S. Bethlehem, N. Y. LB **$501,073**, est. $632,000, (2 bidders), b. conc. 1.42 mi. Normanskill viaduct, SH 9109, Delaware, Pt. 2, SH 41, Rte. 43, R.C. 60-193, Albany Co.,

N. Y.—**Coleman Bros. Corp.**, P. O. Box 31, Readville 37, Mass. LB **$768,799.50**, est. $769,000, (2 bidders), 9 in. conc. pat. 0.57 mi., misc. work 0.04 mi., brgs. comp. I-beam and plate girder 11 sps., 860 total, gate house and fencing, elimination of grade crossing Shakers-Watervliet, SH 879 and Delaware and Hudson R.R. Rte. 155. PSC 18537, Albany Co.,

N. Y.—**Tully & DiNapoli Inc.**, 127-50 Northern Blvd., Flushing, N. Y. LB **$6,637,704.40**, est. $7,652,000, (9 bidders), c. conc. pavt. 0.18 mi., 3 HGS rigid frame 3 span 186.6 ft. total, 2 sps. 107.1 ft. total, 1 sp. 36.7 ft total, 1 HGS comp. beam 1 sp. 170.2 ft. 1 HGS comp. beam, 4 sps. 267.6 ft. total, 1 sp. concrete slab 48 ft. 1 HGS pl. gird. 1 span 209 ft. Interstate Rte. Conn. 511 Cross Bronx Expressway-Cont. 2A, Major Deegan Expressway Interchange, Undercliff Ave. to Plimpton Ave. Rte. 95, FICBE 60-5, Proj. Ej-95-1(47), **Bronx Co.,**

N. Y.—**L. G. DeFelice & Son**, Nettleton Ave., North Haven, Conn. LB **$2,378,114.16**, est. $3,565,000, (10 bidders), b. conc. type 1A, 6.19 mi., HGS prestressed concrete beam 7 spans, 352.6 in. total, Interstate Rte. 502, Section 7C-11 and 7C-12 (Moffitt Rd. to Stratton Rd.), Rte. 87, FISH 60-15, Proj. I-87-4(10), Clinton Co.,

N. Y.—**Perini Corporation**, 73 Mt. Wayne Ave., Framingham, Mass. LB **$3,383,199.95**, est., $5,022,000, (8 bidders), b. conc. type 1a, 7.76 mi., misc. work 0.19 mi. 4 HGS prestress, conc. beam 6 sps. 320 ft. total, 3 sps. 178 ft. total, 3 sps. 152 ft. total, 6 sps. 314 ft. total, 1 br. rein.-conc. box 2 sps. 15 ft. each, 1 br. rein.-conc. open box 2 sps. 15 ft. each, 2 RRGS prestress, conc. beam 3 span 133 ft. total, 3 sps. 133 ft. total Interstate Rte. 502 Sections 7C-2 and 7C-3, (Stratton Rd. to Miner Farm Rd.), Rte. 87 FISH 60-14, Clinton Co.,

N. Y.—**John Arborio Inc.**, W. Cedar St., Poughkeepsie, N. Y. LB **$9,945,991.66**, est. $11,600,000, (8 bidders), 9 in. cen. conc. pavt 7.36 mi., access 1.85 mi., 3 br. rein-conc. boxes, 23.2 ft., 24.4 ft., 20.4 ft. skew spans, 1 br. comp. haunced gird. and beam, 5 spans, 576 total, 6 brs. comp. beam, 3 sps. 165 total 5 sps., 518 ft. total, 1 sp. 64 ft. 4 sps. 165 total, 1 br. rein-conc. rig. frame, 1 sp. 50.3 ft., East Branch-Sullivan Co. Line, Pt. 1, SH 5383A, Hancock-East Branch, Pt. 2, SH 5246, Hancock-East Barnch, Pt. 1, Rte. 17. R.C. 60-187, SH 5456, Delaware Co.,

N. Y.—**Suburban Excavators, Inc.**, 4 New Salem St., Wakefield, Mass., LB **$3,227,185.65**, est. $4,170,000 (7 bidders), b. conc. 7.63 mi., 1.17 mi. bridge-rein.-con. box 20.8 ft. span brigs. NYCRR prestress conc. beams, 3 spans 139.4 ft. total, HGY-Comp. I-beam, 4 spans 200.2 ft. total Billings-Poughquag, SH 8525 Stonehouse-Stomville SH 1162 Stonehouse-Pawling SH 1677, Pawling-Patterson, SH 343 Pawling Village, SH 5009, Rte. 22, 55, FARC 60-110, Proj. F01025(3), Dutchess Co.;

N. Y.—**"Les" Strong, Inc.**, Whitney Point, N. Y., LB **$1,547,750.25**, est. $2,000,000 (16 bidders), b. conc. type 1A, 3.6 mi., misc. work 0.06 mi., RRGS-comp. WF beam 1 Sp. 82 ft. Watertown-Philadelphia Pt. 1-C, SH 5681; Watertown-Philadelphia PT 2, SH 5617, Rte. 11 R.C. 60-189, Jefferson Co.;

N. Y.—**Howes & Farrell, Inc.**, Box 85, Oneida, N. Y., LB **$463,993.75**, est. $609,000, (11 bidders), b. conc. type 1A, comp. I-beam Br. 2 spans, 124.1 ft. total, West Leyden-Constableville, Pt. 2, SH 8188; Constableville-Lyons Falls, Rte. 26, R.C. 60-188, Pt. 1, SH 1600, Lewis Co.;

N. Y.—**Horn Const. Co., Inc.**, 2174 Hewlett Ave., Merrick, L. I., N. Y., LB **$10,188,823.35**, est. $11,083,000 (6 bidders), 7½ in. rein.-con. slab roadway (on viaduct) 0.56 mi. misc. work 0.05 mi. sheet asph. pavt. 0.57 mi., wid'n. and strengthen exist. elevated steel structure, 33 sps. 2,946 ft. total, Interstate Rte. Conn. 512 Gowanus Expressway Cont. 2 (Hamilton Ave.-Clinton St. to Second Ave. Rte. 278, FIGE 6003 Proj. EI-278-1(54), Kings Co.;

N. Y.—**Cold Spring Const. Co.**, 3 Jackson St., Akron, N. Y., LB **$668,503**, est. $824,000 (11 bidders), top course bit. mac. 5.58 mi., misc. work 0.03 mi. Nunda-Dansville, Pt. 2, Co. Rd. FASS 60-19, Proj. S-501(3), Livingston Co.;

N. Y.—**The Lane Const. Corp.**, 965 E. Main St., Meriden, Conn., LB **$5,039,013.64**, est. $6,179,000, (9 bidders), 9 in. rein. con. pavt. 1.79 mi. acc. 3.77 mi., 1 HGS prestressed conc. beam br. 4 sps. 193 total, 6 HGS comp. I-beam brs. 3 sps. 131.5 ft. total, 3 sps. 126.5 ft. total; 3 sps. 148 ft. total, 3 sps. 1203.8 ft. total, 4 sps., 206.5 ft. total, 4 sps. 217.5 ft. total, 4 HGS comp. pl. gird. brs. 3 sps. 281.3 ft. total, 3 sps. 269.1 ft. total, 1 sp. 150 ft., 1 sp. 150 ft., 1 RRGS through pl. gird. br. 2

sps. 144 ft. total Interstate Rte. Conn. 380, Rochester Western Expressway (Howard Rd. to Rochester City Line), Rochester Outer Loop (Chili Ave to Lyeel Ave.), FISH 60-13 FAC 60-26, Proj. I-490-2(20); U-UG-1093 (9), Monroe Co.;

N. Y.—**Lizza & Sons, Inc.**, 152 South St., Oyster Bay, N. Y., LB **$2,045,333**, est. $2,733,000 (9 bidders), cec. conc. pavt. 2.74 mi., misc. work 1.02 mi. Conduit Blvd.-Contr., SH 5701A, Pt. 5, Beech St. to Unqua Rd. Rte. 27 FAEC 60-191, Proj. U-947(23), Nassau Co.;

N. Y.—**Green Valley Landscape**, 97-36 50th Ave., Corona 68, N. Y., LB **$192,721.75**, est. $237,000, (10 bidders), landscaping, traffic signs, delineators 4.45 mi., Long Island Expressway, Cont. 3, (Guinea Woods Rd. to Jericho Turnpike, Rte. 24, FALIE 60-4, Proj. U 862(29), Nassau Co.,

N. Y.—**Amadus, Inc.**, 1830-43 St., L. I. City, N. Y. LB **$90,970**, est. $93,000, (2 bidders), traffic signs 3.39 mi. (5.99 acc.) Long Island Expressway-Cont. 4, Jericho Turnpike to South Oyster Bay Rd. Rte. 24, Faliets 60-4, Proj. U-862(30), Nassau Co.,

N. Y.—**Lizzo & Sons, Inc.**, 152 South St., Oyster Bay, N. Y., LB **$594,950.50**, est. $841,000, (6 bidders), b. conc. pavt. 4.1 mi. Massapequa-Glen Cove, SH 9017 (Merrick Rd. to Hempstead Turnpike, Rte. 107, R. C. 60-192), Nassau Co.,

N. Y.—**Warren Bros. Roads Co.**, Syracuse, N. Y., LB **$246,283.75**, est. $291,000, (5 bidders), b. conc. type 2A inc. repairs to Bridge No. 1, 3.6 mi. March Hill-Renton, SH 931 Rte. 12, RC. 60-153, Oneida Co.,

N. Y.—**Collins Bros. Inc.**, 12 Tallmadge Pl., Mechanicville, N. Y., LB **$1,188,881**, est. $1,314,000, (6 bidders), 9 in. cem. conc. pavt. 2.1 mi. precast conc. beam 1 sp. 31.8 ft. Mohawk River Turnpike Amsterdam Tribes Hills SH 108, City of Amsterdam East-West Art. Hgy., Rte. 5, FAC 60-29 FARC 60-194, Proj. FU 349(15), Montgomery Co.,

N. Y.—**Weber Constr. Co., Inc.**, 133 Wall St., Schenectady, N. Y., LB **$2,215,154.95**, est. $2,900,000, (9 bidders), 9 in. cec. conc. pavt. 1.22 mi., (2.04 mi. acc), 3 HGS comp.-I-beam 4 sps. 216.5 ft. total, 4 sps. 195.2 ft. total, 4 sps. 179.5 ft. total, ped underpass enclosed box Interstate Rte. conn. 550 (Michigan Ave. to Schenectady Crosstown Conn., Pt. 1, Rte. 890, FIC 60-18, FISH 60-9 Proj. I-890-5, Schenectady Co.,

N. Y.—**John Arborio Inc.**, W. Cedar St., Poughkeepsie, N. Y., LB **$212,298.75**, est. $217,000, (3 bidders), b. conc. type 1A, 0.18 mi., comp. I-beam bridge 113 ft. span Liberty-County Line Pt. 2, SH 5234, Rte. 17, R.C. 60-176, Sullivan Co.,

N. Y.—**Bero Constr. Corp.**, Box 70, Waterloo, N. Y., LB **$1,429,872**, est. $1,725,500, (12 bidders), b. conc. type 1A-8.634 mi. Comp. WF truss Bridge 3 sps. 324 ft. total Palmyra-Marton, SH 1714 Marion-Williamson, Pt. 1, SH 992, RTE. 21, R.C. 60-190, Wayne Co. CD 11/1.

NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany,

Camarco Contrg., Inc., Carmel, N. Y., CA **$769,958**, est. $930,000, 9 in. c. conc. pavt. 1.92 mi., grade 0.33 mi., access 0.25 mi. 0.27 mi., b. conc. pavt. bridge, comp. plate gird. 1 sp. 102.5 ft. Bedford-Goldens Bridge, SH 5298A, Katonah-Cross River, SH 9251 Rtes. 22 & 35. R.C. 60-182, Westchester Co. Bids Nov. 17, awarded early December. CD 11/18, under LB.

Edenwald Contg. Co., 151-45 6 Rd., Whitestone, N. Y., CA **$587,700**, grading, curbing, constr. sidewalks, malls, retaining walls, fences and drainage facilities, etc. Cypress Hills St. (Fresh Pond Rd.) from Interborough Parkway to Jamaica Ave. and Euclid Ave. from Jamaica Ave. to 170 ft. south of Jamaica Ave., Brooklyn and Queens Boros, BROOKLYN, N. Y. President Brooklyn Boro, Rm. 21, Boro Hall, Brooklyn 1, N. Y. Bids Nov. 16, awarded Dec. 9. CD 11/21, under LB.

Namron Constr. Corp., 43 N. Village Ave., Rockville Centre, N. Y., CA **$866,397**, Contr. BP-210.003 pier shed on Pier No. 8, Brooklyn Port Authority Piers, BROOKLYN, N. Y. Port of New York Auth., Rm. 1100, 111 Eighth Ave., New York 11, N. Y. Bids Nov. 22. CD 11/25, under LB.

Layne Co. New York Co., Inc., 150 Denton Ave., Garden City Park, N. Y., LB **$73,890**, (3 bidders), Contr. 1, Well and Pump Equip. No. 15, Jericho, EAST NORWICH, N. Y. Jericho Water Dist., North Hempstead Turnpike, East Norwich, N. Y. Sidney B. Bowne & Son, 161 Willis Ave., Mineola, N. Y., engrs.

Heroes Excavating & Contracting Corp., 29 9 St., Brooklyn 31, N. Y., LB **$939,597**, (6 bidders), refuse incinerator, VALLEY STREAM, N. Y. Village, S. Central Ave., Valley Stream, N. Y. Bids Dec. 7. CD 11/18.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 12/8,

Union Bldg. & Constr. Corp., 315 Howe Ave., Passaic, N.J., LB **$346,409**, (8 bidders), wid'n. 2.3 mi. section Rt. 510 located between Ridgedale Ave. in Florham Park and Park Ave., Hanover Twp., Morris Co. CD 11/21.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

N. J.—**Union Paving Co.**, Wynnewood, Pa., CA **$1,118,393**, resurf. intersection imprvts. and barrier curb 6.353 mi. US Rte. 130, Sections 7B and 10B from Burlington to Camden, Burlington Co.;

N. J.—**George M. Brewster & Son, Inc.**, 275 West Fort Lee Rd., Bogota, N. J., CA **$932,393**, sand drains, etc., 0.284 mi. Rte. 80, Section 5J, vicinity of Green and Wesley Sts., Hackensack and Teterboro, Bergen Co. Bids Nov. 23, awarded Dec. 8. CD 11/28, under LB.

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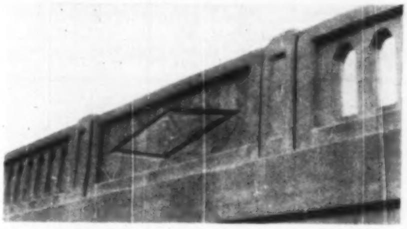

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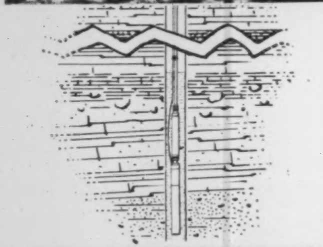

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3 A complete line to meet operating heads and capacities required.

Pump Type	Unit O. D.	Horsepower Range			Gallons Per Minute		Head In Feet	
		230 V 1 ph.	220 V 3 ph.	440 V 3 ph.	Minimum	Maximum	Maximum	Minimum
F-30AE	6"	5-7½	5-15	5-20	24	43	1600	220
D-33E	6"	5-10	5-20	5-40	28	56	2400	180
D-47E	6"	5-10	5-20	5-40	34	72	2000	140
G-70E	6"	5-10	5-20	5-40	42	100	1800	100
G-120	6"	5-10	5-30	5-40	93	158	1100	60
G-160	6"	5-10	5-30	5-40	86	186	900	60
I-200	8"	7½	7½-30	7½-40	80	272	800	80
FR-300	8"	7½	7½-40	7½-40	137	425	400	40
J-400	8"		15-40	15-40	265	625	240	40

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PENNSYLVANIA—State Hy. Dpt., Harrisburg,

Herbert R. Imbt, Inc., Box 155, State College, Pa., CA **$817,644**, Traffic Rte. 322, between Pinegrove Mills and Boalsburg, 5.03 mi., crushed aggregate base with bit. surf., 5 structures, new alignment and grade line, Centre Co. Bids Nov. 18. CD 11/23, under LB.

▲† **U. S. Eng.**, 2635 Abbottsford Rd., Phila., Pa., cancelled bids to have been opened about Dec. 8, stone-faced earth levee, storm drainage collection and pumping station, access road, and subdrainage system, south bank of Lehigh River between the Hill to Hill Bridge and point about 250 ft. east of Minsi Trail Bridge, ENG-36-109-61-17, PENNSYLVANIA. **$4,000,000.** (**Correction**—project location). CD 12/9.

Union Paving Co., 1 East Wynnewood Rd., Wynnewood, Pa., CA **$168,549**, Bid 3849, resurfacing, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 11/28/58.

Charles F. Smyth, Inc., Kennett Square, Pa., LB **$452,523**, Bid 2676, water mains, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 11/15;
Spiniello Constr. Co., 249 Wallace St., Orange. N. J., LB **$128,975**, Bid 2677, water mains, (Phila., Pa.).

Lycoming Constr. Co., Inc., Susquehanna St., Williamsport, Pa., CA **$175,500**, Contr. 3, constr. Fox Hollow Run Pumping Station, Contr. 4, electrical work on pump station, Contr. 5, Fox Hollow Run Storm Sewer, Contr. 6, Reach Road Storm Sewer, WILLIAMSPORT, PA. Office of City Clerk, City Hall, Williamsport, Pa. Bids Nov. 17. CD 10/31.

† **Lane Constr. Co.**, 965 E. Main St., Meriden, Conn., LB **$463,568**, (2 bidders), bit. surfaced roads, FY 61 M.C.P. ENG-49-080-61-22(22), ANDREWS AIR FORCE BASE, MD. U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C. Bids Dec. 6. CD 11/9.

▲† **Regal Constr. Co., Inc.**, Rte. 1, Box 280-F, Upper Marlboro, Md., LB **$1,536,808**, (8 bidders), parking facilities,. D. C. Stadium, WASH., D. C., National Park Service, Dpt. Interior, 19 and C Sts., N.W., Wash., D. C. Bids Dec. 8. CD 12/5.

BUILDINGS—LB & CA

▲ **Websco Constr. Corp.**, 108 S. Franklin Ave., Valley Stream, N. Y., CA **$2,062,000**, Spec. 15838-C, general contract BLDG. No. 4, incl. service connections, Dpt. P. Wks., State Office Bldg., Campus Site, ALBANY, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. Bids Nov. 16. CD 11/22, under LB.

Thatcher Constr. Co., Inc., 301 Madison Ave., New York 17, N. Y., CA Est. **$650,000**, 6 story, 96 unit APARTMENT, between Bay 49 and Bay 50 Sts. on Cropsey Ave., BROOKLYN, N. Y. Owner, c/o Contractor. V. S. Todaro, 1901 W. 12 St., Brooklyn 23, N. Y., archt. Awarded Oct. 1960.

▲ **Milan Assocs., Inc.**, 310 Northern Blvd., Great Neck, N. Y., CA Est. **$1,250,000**, 80,000 sq. ft. ELECTRICAL MANUFACTURING PLANT, Smith St. and new Hy., East Farmingdale, FARMINGDALE, N. Y. Electrical Fittings Corp., 37-50 57 St., Woodside, N. Y. Arthur Silver, 21 E. 40 St., New York, N. Y., archt. Awarded late Nov. 1960.

▲ **W. J. Barney Corp. & William L. Crow Constr. Co.**, 101 Park Ave., New York, N. Y., CA **$9,600,802** superstructure 3 level George Washington Bridge BUS STATION over George Washington Expressway between Fort Washington and Wadsworth Aves., NEW YORK, N. Y. Port of New York Auth., 111 8 Ave., New York 11, N. Y. Pier Luigi Nervi, c/o owner, archt. CD 3/22.

Harry De Angelo, Haddon Heights, N. J., CA Approx. **$150,000**, VEHICLE STORAGE and OFFICE, HADDON HEIGHTS, N. J. New Jersey Water Co., Haddon Heights, N. J. and American Water Works Service Co., Inc., Penn Center Plaza, Phila., Pa. CD 9/23.

Mitchell Engineers & Constructors, Paoli, Pa., CA Over **$110,000**, WAREHOUSE and OFFICE, MOUNT HOLLY, N. J. Gsell Moving & Storage, Mount Holly, N. J.

▲ **Nathan Lerner & Nelson Gross**, 80 Huguenot Ave., Englewood, N. J., Owner Builds, **$1,500,000**, 75 HOUSES, Woodland Ave., NORTHVALE, N. J. Arthur Davis, 133 Engle St., Englewood, N. J., archt.

Milne & Markert, Steiner Pl., North Plainfield, N. J., CA Approx. **$400,000**, PROFESSIONAL OFFICE, Park Ave. and Seventh St., PLAINFIELD, N. J. Dr. H. S. Tobey, 435 Tappan Ave., North Plainfield, N. J. Sidney Schenker, 52 Church St., Paterson, N. J., archt.

▲ **Wayne Park, Inc.**, Morris (Stein & Morris Kadel, Owners), 920 Main St., Hackensack, N. J., Owner Builds, **$3,200,000**, 115 HOUSES, Ratzer Rd., WAYNE, N. J. Kordys & Oldziey, 1379 Hamburg Twp., Wayne, N. J., archts.

Glen View Development Co., 477 Main St., Hackensack, N. J., Owner Builds, **$850,000**, 40 HOUSES, Sicomac Ave., WYCKOFF, N. J. Gerber & Pancani, 11 Commerce St., Newark, N. J., archts.

▲ **Talley & Hurst, Inc.**, 2901 Bayard St., Wilmington, Del., LB **$1,000,000**, RECEPTION CENTER, KENNETT SQUARE, PA. Longwood Gardens, Kennett Square, Pa.

Harry Gill, 6326 Market St., Phila., Pa., CA **$110,000**, ICE CREAM PLANT ADDN., PHILA., PA. Potts Ice Cream Co., 630 N. 20th St., Phila., Pa. Howard D. Rosengarten, 34 S. 17th St., Phila., Pa., archt.

Welsh Grant, 2700 Knorr St., Phila., Pa., Owner Builds, **$504,000**, RESIDENTIAL DEVEOPMENT (52), Rising Sun Ave., etc., PHILA., PA. Leis J. Cowan, 1505 Pine St., Phila., Pa., archt.

Arthur A. Kober Co., 9 Union Ave., Bala Cynwyd, Pa., CA **$110,000**, WAREHOUSE, OFFICE addns., alterations, PHILA., PA. Theresa Friedman & Sons, Stenton

Ave. and Washington Lane, Phila., Pa. William Padlasky, 1211 Walnut St., Phila., Pa., engr.

MacKenzie & Nimmer, 1984 Medary St., Phila., Pa., CA **$750,000**, MOTOR MOTEL, RESTAURANT, and swimming pool, PHILA., PA. Owner, c/o contractor. Samuel L. Malkind, 342 Madison Ave., New York, N. Y., archt.

▲ **Brookmeade Development Co.**, Centerville Rd., Wilmington, Del., Owner Builds, **$1,500,000**, RESIDENTIAL DEVELOPMENT (110) Centerville Rd., etc., WILMINGTON, DEL.

Capano Constr. Co., 1035 Philadelphia Pike, Wilmington, Del., Owner Builds, **$775,000**, RESIDENTIAL DEVELOPMENT, Weldin Rd., etc., WILMINGTON, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

† **Va., Yorktown**—PIER TRACK REPAIRS—BA 12/27—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Station, Norfolk, repairs to pier track, Naval Weapons Station, NBy-33756. Under $25,000.

† **Fla., Cocoa**—FIRE STATION ADDN.—BA 12/28—Procurement Office, Air Force Missile Test Center, Patrick Air Force Base, addn. to Fire Station, Bldg. 810, Patrick Air Force Base. $25,000-$100,000. CD 10/6.

† **Va., Norfolk**—HEATING SYSTEM IMPRVS.—BA 12/29—Dist. P. Wks. Office, Fifth Naval Base, Room 307, Bldg. N-26, U. S. Naval Station, Norfolk, replacement heating systems, Bldgs. SP-50, U-20, V-60, V-64, V-88 and LF 18, Naval Air Station, NBy-33779. $100,000-$250,000.

† **Florida**—BA About 1/5—U. S. Eng., P. O. Box 4970, Jacksonville, repair of damage along Canal 39A and Canal 40, Sec. 2, and constructing stone protection at Structures 49, 72 and 75, the repairs along C-39A and C-40 Sec. 2 include shoal excavation by hydraulic dredging, short stretch of mound construction, berm and embankment repairs that include fertilizing, seeding, berm mulching, and fertilizing, and designated repairs, made at 30 separate pipe culverts, the stone protection at S-49, S-72 and S-75, installing bedding and riprap at eroding areas at those structures, Central and Southern Florida Flood Control Project, CIVENG-08-123-61-40. $300,000. Plans deposit $4. CD 9/21.

BUILDINGS—BA

† **Va., Norfolk** — FUEL TESTING LABORATORY — BA 12/27—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Station, expansion of fuel testing laboratory, Naval Supply Center, NBy-30658. Under $25,000. CD 6/22.

† **Ga., Albany**—SHOP VENTILATION—BA 1/4—Dist. P. Wks. Office, U. S. Naval Base, Charleston, S. C. shop ventilation, Bldg. No. 2200, U. S. Marine Corp Supply Center, (NBy 29141), $25,000-$100,000. CD 8/27/56.

▲ **N. C., Chapel Hill**—DORMITORIES—BA 1/11—University of North Carolina, South Bldg., two 6 and 7 story, 130,000 sq. ft. each men's dormitories. $3,600,000. Graves & Toy, 118½ E. 4 St., Charlotte, N. C., archts. CD 11/25/59.

▲† **Tenn., Chattanooga**—SERVICE CENTER—BA 2/1—Tennessee Valley Authority, Lupton Bldg., Georgia Ave., power service center. $2,000,000. CD 7/19.

BUILDINGS—SLC

▲ **S. C., Lexington**—PLANT—Argus Cameras Division of Sylvania Electric Products, Inc., 405 4 St., Ann Arbor, Mich. soon lets contract, 100,000 sq. ft. projector mfg. plant. $1,500,000. Smith, Hinchman & Grylls Assocs., Inc., 3107 W. Grand Blvd., Detroit, Mich., archt. CD 10/5.

▲ **Ga., Atlanta**—WAREHOUSE—The Meade Corp. Chillicothe, O. soon lets contract, 1 and 2 story, 218,000 sq. ft. warehouse. Over $1,000,000. Finch, Alexander, Barnes, Rothschild & Paschal, 70 Fairlie St. N.W., archts. CD 10/25.

HEAVY CONSTRUCTION—LB & CA

† **Sutton Co., Inc.**, 4001 Charles City Rd., Richmond 31, Va., CA **$73,024**, stream channel imprvs., Bonds Creek, beginning at point about 2,700 ft. southwest of Highland and continuing upstream approx. 30,300 ft. side tributary channels, imprvs., grade stab. structures, appurtenances, for Soil Conservation Service, WEST VIRGINIA. Little Kanawha Soil Conservation Dist., 217 4th St., Parkersburg, W. Va. Bids Nov. 15. CD 11/7.

† **Whaley & Minter Constr. Co.**, P.O. Box 514, Brunswick, Ga., LB **$137,000**, off-site utilities, for 225 unit Capehart Housing Project, U. S. Naval Base, Glynco, NBy 29144, BRUNSWICK, GA. Dist. P. Wks. Office, U. S. Naval Base, Charleston, S. C. Bids Dec. 6. CD 11/4.

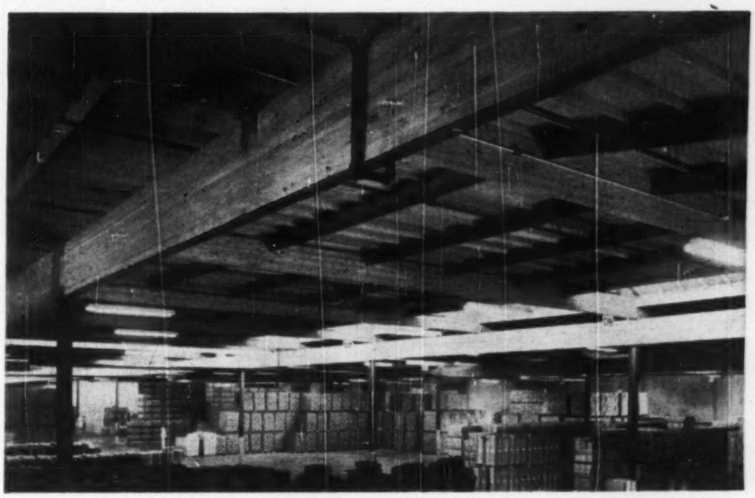
KENTUCKY — Commonwealth of Kentucky, Dpt. Hys., Frankfort,

Foster & Creighton Co., 724 1st National Bank Bldg., Nashville, Tenn., CA **$892,596** (4 bidders), c. conc. pavt. 2.169 mi. Grand Ave. in Newport and Fort Thomas, US 19(5) SP 19-871. Bids Dec. 2. CD 11/9.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Ky.—**W. L. Harper**, 1073 Emerson, Park Hills, Covington, Ky., CA **$1,427,851**, c. conc. pavt. 4.646 mi. Covington-Tennessee State Line, I 75-7(13) 173, Boone Co.;

Ky.—**Shamrock Corp. of Kentuckiana**, Pleasure Ridge, Ky., and **A. J. Schneider**, 3720 7 St. Rd., Shively, Ky., CA **$2,098,343**, c. conc. 7.367 mi. Covington-Lexington, I 75-7(4) 157, Grant Co. Bids Nov. 18, awarded Dec. 7. CD 11/22, under LB.



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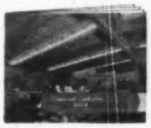
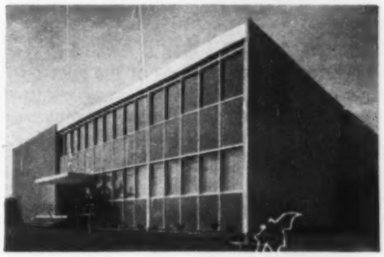
"Both the customer and ourselves are well pleased with the installation," states Grif S. Pharo, Wm. P. Neil Co., Los Angeles, contractor for the new Daetwyler Warehouse, Los Angeles. "We found the initial cost of Rilco laminated wood beams very reasonable . . . the cost of handling and erection very favorable."

Rilco laminated wood beams, arches and purlins cost less to buy, less to erect, less to maintain. Each has a high strength to weight ratio, plus offering the superior fire resistance qualities of glued laminated wood. Members are shipped to job site on time for fast erection by regular work crews—building goes up quicker, is ready for use sooner.



Rilco field sales engineers will be happy to consult with you, without obligation.

Write for free construction catalog



Daetwyler Warehouse, Los Angeles, Calif., constructed with 129 Rilco laminated wood beams. Contractor: Wm. P. Neil Co., Ltd., Los Angeles.

Weyerhaeuser Company
Rilco Laminated Products Division
W801 First National Bank Building
St. Paul 1, Minnesota

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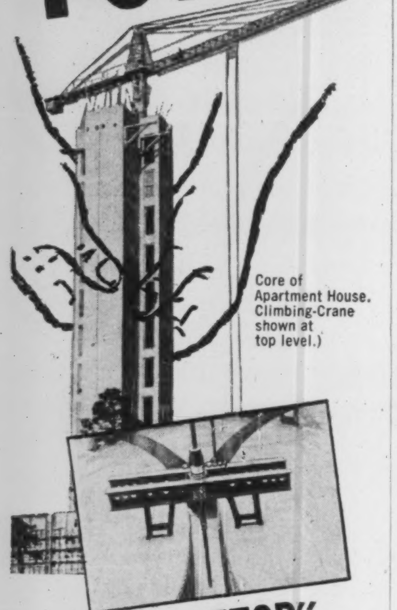
Core of Apartment House. Climbing-Crane shown at top level.)

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Saves time! Concretor equipment raises forms automatically, up to 20 inches an hour!
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30-01 37th Ave., Long Island City 1, N. Y.
San Francisco: 630 Sixth St. Montreal: 625 Faillon St.

Axton Contg. Co., Jeffersonville, Ind., LB **$447,151** (6 bidders), Contr. 380, Phillips Lane Trunk sanitary sewer and laterals, LOUISVILLE, KY. Louisville & Jefferson County Metropolitan Sewer Dist., 412 W. Market St., Louisville 2, Ky. CD 3/15/56.

Clark-Stewart & Wood, P.O. Box 889, Lexington, Ky., LB **$210,735** (8 bidders), sewage treatment plant addn., WINCHESTER, KY. City, City Hall, Winchester, Ky. Bids Dec. 6. CD 10/28.

▲ **Allen Bros. Constr. Co.**, 3742 Lamar Ave., Memphis, Tenn., CA Est. **$1,000,000**, Downtowner MOTOR HOTEL, swimming pool, COLUMBIA, S. C. Jerome Hotel Holding Corp., c/o Davis M. Graham, 2859 Gervais St., Columbia, S. C. George A. Thomason, Dupont Bldg., Memphis, Tenn., archt.

▲ **Batson-Cook Company**—P. O. Box 151, West Point, Ga., CA Est. $4,000,000, 310 units and retail shops, 23 story, 325,000 sq. ft. Peachtree Towers APARTMENTS, ATLANTA, GA. C. D. Spangler Constr. Co., 1028 S. Boulevard, Charlotte, N. C. Frances M. Daves, 57 8th St., N.E., Atlanta, Ga. CD 7/22/59.

▲ **The Coite Sommers Co.**, P. O. Box 111, Vidalia, Ga., LB **$1,059,000**, 47,000 sq. ft. HOSPITAL, CARTERSVILLE, GA. Bartow Co. Hospital Auth., Courthouse, Cartersville, Ga. Bids Dec. 6. CD 11/10.

Settecase & Chillura, 2101 5 Ave., Tampa 5, Fla., CA **$987,780**, est. $1,304,640, (8 bidders), HIGH SCHOOL, Duneden, CLEARWATER, FLA. Pinellas County School Bd., Clearwater, Fla. Bid Dec. 7. CD 11/28.

▲ **Dominion Contractors**, 7100 Beach Plaza, St. Petersburg Beach, Fla., CA Est. **$1,000,000**, 87 units, 108,000 sq. ft. APARTMENT, ST. PETERSBURG, John K. Ruff Enterprises, Inc., 7100 Beach Plaza, St. Peterburg Beach, Fla. Fred Schlotterlein, 7100 Beach Plaza, St. Petersburg Beach, Fla., archts. CD 11/4.

▲ **Mid-South Constr. Co.**, 79 Commerce St., Montgomery, Ala., CA **$1,995,000**, 4 story, bsmnt. LIBRARY, AUBURN, ALA. Auburn University, Langdon Hall, Auburn, Ala. Bids Dec. 1. CD 12/6, under LB.

▲ **M. W. Kellog Co.**, 711 3 Ave., New York, N. Y., CA Est. **$30,000,000**, FERTILIZER and CHEMICAL MFG. PLANT, CHEROKEE, ALA. Armour & Co., 401 Wabash St., Chicago, Ill. CD 11/14.

† **McDowell & McDowell**, 718 Murfreesboro Rd., Nashville, Tenn., CA **$514,987**, extension Martin Rd. at Redstone Arsenal, ENG-01-076-61-21, HUNTSVILLE, ALA. U. S. Eng., P.O. Box 1169, Mobile, Ala. Bids Dec. 1. CD 10/28.

D. S. McClanahan & Son, Inc., P.O. Box 747, Columbus, Miss., LB **$742,231**, brick, concrete SCHOOL, COLUMBUS, MISS. Bd. Trustees Columbus Municipal Separate School Dist., Columbus, Miss. Bids Nov. 16. CD 11/30/50.

▲ **Bechtel Corp.**, 220 Bush St., San Francisco, Calif., CA 6,000 bbl. per day catalytic reformer and orthoxylene REFINERY UNIT, CHALMETTE, LA. Tennessee Oil Refining Co. Div. Tennessee Gas Transmission Co., Tennessee Bldg., Houston, Tex. CD 3/10.
Badger Mfg. Co., 230 Bent St., Cambridge, Mass., CA 2,200 bbl. per day benzene, toluene and xylenes extraction unit (Chalmette, La.).

▲ **R. P. Farnsworth & Co.**, Box 850, New Orleans, La., CA **$1,786,320**, 12 story, limestone, granite OFFICE BLDG., Howard Ave. between S. Rampart and Dryades St., NEW ORLEANS, LA. First National Life Insurance Co., 632 Baronne St., New Orleans, La. Mathes, Bergman & Assocs., 929 Howard Ave., New Orleans, La., archts. Bids Nov. 23, awarded Dec. 12/8. CD 11/29, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Ill., **Quincy**—BA 1/3—City, City Hall, Quincy, Sewerage imprvs., Div. F Section 3B, incl. 18- to 48-in. relief sewers, $250,000, Plans deposit $30; Div. F Section 3A, 6- to 18-in. storm sewers, $150,000, Plans deposit $30. William H. Klingner & Assocs., 617 Broadway, engr. CD 1/7.

O., **Grove City**—BA 1/5—Village, Village Hall, sewage treatment plant. $200,000. CD 11/15.

† Mich., **Kincheloe Air Force Base**—INDUSTRIAL TYPE BLDG. ADDN.—BA 1/10—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 26, steel frame, masonry industrial type bldg. addn., paving, utilities and related work, ENG-20-064-61-29. Under $300,000. Plans deposit $1.80. CD 7/26.

† O., Dayton—ARMAMENT and ELECTRONICS SHOP—BA 1/10—U. S. Eng., Box 59, Louisville, Ky., armament and electronic shop, Wright Patterson Air Force Base, ENG-15-029-61-8. $100,000. Plans deposit $5.50. CD 9/29.

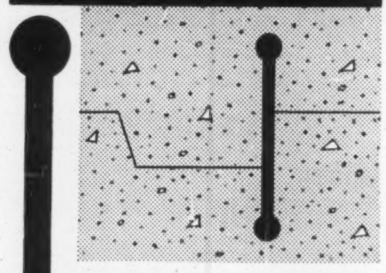
† **Illinois**—BA 1/18—U. S. Eng., 536 S. Clark St., Chicago, floodwall and closure structures alterations, seepage cut off wall, Wood River Drainage and Levee Dist., Proj. Item I G (R), Madison Co., along sides of east fork Wood River, vicinity of East Alton, CIVENG—23-065-61-35. Under $25,000. CD 9/23.

BUILDINGS—BA

O., **Columbus**—GYMNASIUM, etc.—BA 1/10—Dpt. P. Wks., State Depts. Bldg., gymnasium, pool and chapel, at Juvenile Diagnostic Center. Plans deposit $25. Outcalt, Guenther & Van Buren, 61 S. 6th St., archts.

▲ O., **Dayton**—HOSPITAL—BA 1/10—Franciscan Sisters of the Poor, St. Elizabeth's Hospital, hospital addn. $1,625,000. Plans deposit $50. Lorenz & Williams, 2600 Far Hills Bldg., Zone 19, archts. CD 2/26/59, under St. Elizabeth's Hospital as owner.

WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



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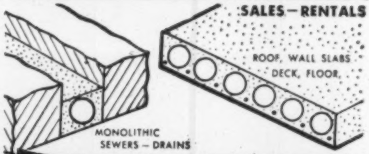

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PHOENIXVILLE, PA.
Subsidiary—Phoenix Steel Corporation

▲ O., **Oxford**—DORMITORY—BA 1/12—State of Ohio and Miami University, Oxford, Dormitory 6. $1,000,000. Cellarius & Hilmer, 4 and Main St., Cincinnati, archts. CD 7/3/59.

▲ O., **Chillicothe** — LAUNDRY — BA 1/24 — Veterans Admin., Munitions Bldg., Wash., D. C., Laundry Bldg. No. 25, addns., alterations, steam distr. system extension, Veterans Admin. Hospital. $1,250,000. CD 10/5/59.

BUILDINGS—SLC

▲ O., **Akron**—WAREHOUSE, etc.—A. Polsky & Co., High and State Sts., soon lets contract warehouse and parking facilities. $3,000,000. Tuchman & Canute, 777 Market St., Akron, and John Graham & Assocs., 444 5th Ave., New York, N. Y., archts. Bids Oct. 26 rejected. CD 10/19.

HEAVY CONSTRUCTION—LB & CA

OHIO—Dpt. Hys., State Depts. Bldg., Columbus, Zone 15,

cancelled bids to have been opened Nov. 29, Type T 71 and structures 8.588 mi., US Rte. 21 11.49, 0.00, Proj. 776, Stark and Wayne Counties. CD 11/17.

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, Bids opened 11/29,

O.—**Carl Myers & Co., Inc.**, 2257 Wickliffe Rd., Columbus, O., LB **$273,374**, est. $276,000 (6 bidders), Type T 35 2.237 mi., State Rte. 218 (15.39-17.05) S-1121(6), Proj. 765, Gallia Co.;

O.—**The Penker Constr. Co.**, 1030 Summer St., Cincinnati, O., LB **$5,593,499**, Alt. LB $5,595,722 (with alt. ref. No. 28A), est. $6,522,600 (7 bidders), Type T 71 and structures 3.093 mi. US Rte. 25 0.83, I 75-1(43)00, City of Cincinnati, Proj. 766, Hamilton Co.;

O.—**S. T. Kenyon & Co., Inc.**, P.O. Box 1031, Portsmouth, O., LB **$422,038**, est. $442,800 (5 bidders), Type T 35 and structures 1.538 mi., State Rte. 139 (11.52) (15.29) S 560(6), Proj. 767, Scioto Co.;

O.—**The C. F. Replogle Co.**, P.O. Box 308, Circleville, O., LB **$4,681,885**, est. $5,402,000 (8 bidders), Type T 71 and structures 5.08 mi., US Rte. 30 9.50, 10.80 (Pts. 1 and 2) F-U-UG-1072(3), City of Wooster, Proj. 768, Wayne Co.;

O.—**Standard Asphalt & Tar Co.**, P.O. Box 3004, Charleston, W. Va., LB **$168,299**, est. $150,100 (1 bidder), Type T 35 1.962 mi., US Rte. 35 19.35, Proj. 771, Gallia Co.;

O.—**The W. L. Harper Co.**, 2910 E. Highland Ave., Cincinnati, O., LB **$127,464**, est. $128,100 (3 bidders), Type T 35 0.591 mi. US Rte. 22 10.61, Proj. 772, Hamilton Co.;

O.—**Schoen Paving, Inc.**, 310 S. Westwood Ave., Toledo, O., LB **$2,049,514**, est. $2,331,000 (3 bidders), Type T 35 and structure, 5.842 mi. US Rte. 223 (0.77-0.92) (1.78-6.27), Village of Sylvania, City of Toledo, Proj. 773, Lucas Co.;

O.—**Walter L. Follmer, Inc.**, 102 Riverside Dr., Hamilton, O., LB **$398,454**, est. $470,800 (4 bidders), Type T 35, 14,345 mi., US Rte. 127 6.45, 15.85 (20.01-23.59) 23.97, Village of West Manchester, Proj. 775, Preble Co.;

O.—**Frantz Bros., Inc.**, 313 E. Court St., Sidney, O., LB **$94,079**, est. $89,800, (1 bidder), Type T 35, structure 0.212 mi. State Rte. 708 (2.10-2.19), Village of Russells Point, Proj. 777, Logan Co. CD 11/17.

Abbott Constr. Co., 5789 N. Lincoln Ave., Chicago, Ill., LB **$899,600**, est. $750,000, No. 80.78-60-5, Stage VI, pier shed alterations, Navy Pier, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Dec. 7. CD 11/18.

Best Way Constr. Co., Inc., 8739 Waukegan Rd., Morton Grove, Ill., LB **$316,000**, shop, Washington Park, CHICAGO, ILL. Chicago Park Dist., 425 E. 14th St., Chicago 5, Ill. Bids Nov. 30. CD 6/11/57.

▲† **Pathman Constr. Co.**, 1735 W. Fullerton Ave., Chicago, Ill., LB **$1,058,000**, (9 bidders), modifying Hangar P12, Chanute Field, No. 11-032-61-25, RANTOUL, ILL. U. S. Eng., 1819 W. Pershing Rd., Chicago, Ill. Bids Dec. 6. CD 11/17.

† **Great Lakes Dredge & Dock Co.**, 1630 Williamson Bldg., Cleveland, O., LB **$523,900**, est. $491,300, (4 bidders), dredging St. Clair River, Stag Island between Marine City and St. Clair, CIVENG-20-064-61-23, MICHIGAN and ONTARIO. U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich. Bids Dec. 6. CD 11/11, under Michigan.

† **Dunbar & Sullivan Dredging Co.**, 2312 Buhl Bldg., Detroit 26, Mich., LB **$918,716**, est. $800,172, (4 bidders), dredging lower Livingstone Channel and East Outer Channel, Detroit River, CIVENG-20-064-61-28, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich. Bids Dec. 8. CD 11/28.

▲† **A. S. Wikstrom Co., Inc.**, Box 217; Skaneateles, N. Y., LB **$4,947,950**, est. $4,947,950, (9 bidders), First Stage, remove existing lock, build cofferdams, east and west centerpiers, access bridge, etc. remove existing Poe Lock, St. Mary's River, Sault Ste. Marie, CIVENG-20-064-61-19, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit 25, Mich. Bids Dec. 9. CD 12/5.

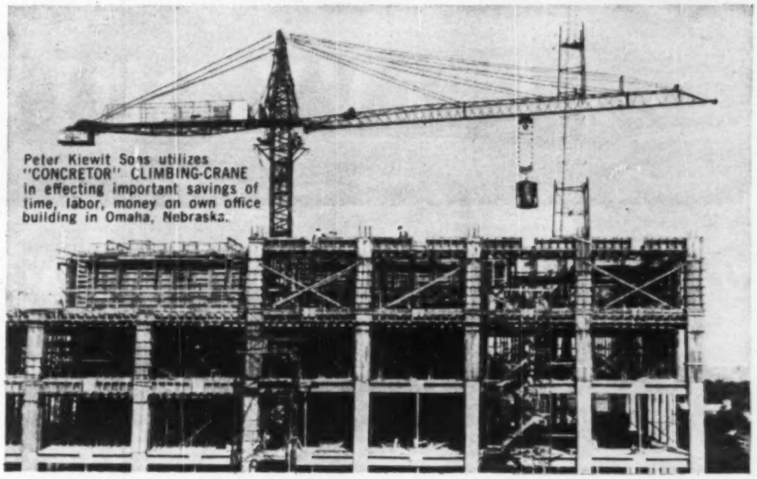
BUILDINGS—LB & CA

Knowlton Constr. Co., 1133 W. Columbus St., Bellefontaine, O., LB **$899,822**, (7 bidders), West Green DORMITORY, Ohio University, ATHENS, O. Dpt. P. Wks., State Depts. Bldg., Columbus 15, O. Bids Dec. 6. CD 11/11.

Knowlton Constr. Co., 1133 W. Columbus St., Bellefontaine, O., CA **$767,700**, ELEMENTARY SCHOOL, HIGH SCHOOL, MILFORD, O. Bd. Educ., Milford, O. Bids Nov. 29. CD 11/11.

(Continued on page 164)

HOW "CONCRETOR" CLIMBING-CRANES REVERSE RISING CONSTRUCTION COSTS



Peter Kiewit Sons utilizes "CONCRETOR" CLIMBING-CRANE in effecting important savings of time, labor, money on own office building in Omaha, Nebraska.

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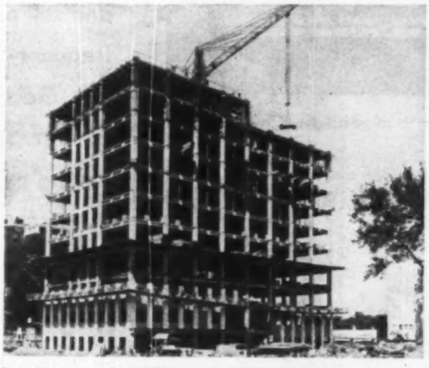
"CONCRETOR" CLIMBING-CRANES quickly and efficiently place loads "on a dime"... up to 100 foot radius due to the 360 degree swing of its 100 foot jib. They eliminate the need for street access and expensive rehandling of materials over unnecessary ramps and runways, thus substantially lowering operating costs ... while also serving to keep community relations on a pleasant, friendly level.



Scandinavian "CONCRETOR" CLIMBING-CRANES are recommended for all types of construction including industrial, apartment and office buildings, silos, water towers, bridges and viaducts. Perfect when slipped with "CONCRETOR" hydraulic slipform equipment (see adv. opposite page).

Crane is remote-controlled by one man from working deck with 3½ lb. electronic panel. He is free to move to any part of the job, and to assist in loading and unloading.

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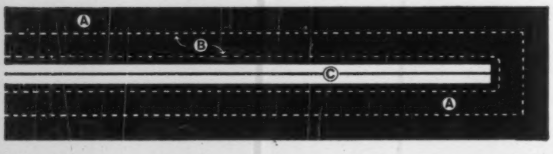
"LONG-LIFE" * *Tensilized Nylon* BELTING

An entirely **new** belting construction, with a carcass consisting **only** of plies of ***Tensilized Nylon** instead of the usual woven fabric.

Guaranteed to last longer than the finest belting you have ever used, for handling the roughest and heaviest loads:

CRUSHED ROCK, TUNNEL MUCK, ORES, DOLOMITE



(A)—Rubber or Synthetic Top and Bottom Covers. (Reversible)
(B)—Breaker strips.
(C)—Two Plies of ***Tensilized Nylon**... Stronger than Five Plies of Heavy-duty Belt Duck.

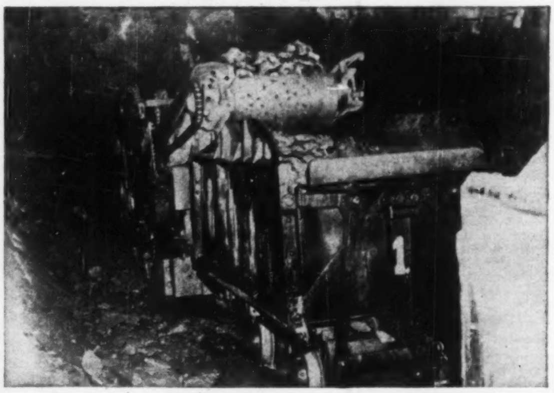
If you are now using the best belting you can buy and still paying a high cost for short belt life, **plus** frequent downtime for repairs, stretch take-up, etc., Goodall ***Tensilized Nylon** Belting is your answer. You will welcome this amazingly **stronger** belting that's guaranteed to cut your belt replacement costs to an unprecedented low.

Here's What This New Belting Means in SAVINGS:

In cases of severe service, where present belt life may now be measured in months, "Long-Life" ***Tensilized** (Oriented) **Nylon** Belts will increase that life, reduce the cost per ton of material carried and eliminate downtime for repairs.

In the toughest of all services—tunnel mucking—"Long-Life" ***Tensilized Nylon** Belting will last two to three times longer without breakdown, handling increased tonnage at a new low cost per cu. yd.

EXAMPLE—A prominent Contractor reports 60,000 cu. yds. of excavated rock handled on a length of Goodall ***Tensilized Nylon** Mucker Belting where only 20,000 to 30,000 cu. yds. could be handled on belts previously used on this tough tunnel job. What's more, there was **no downtime** with the new belt.



This Revolutionary Advance OR BELT CONSTRUCTION!

"LONG-LIFE" * *Tensilized Nylon* BELTING

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Construction—Conveying crushed rock in largest sizes. On mucking machines in tunnel excavating, where severest shock and abrasion are encountered.

Quarrying—Conveying crushed rock and stone, trap rock, heavy limestone.

Mining—Handling primary and secondary crushed ores, iron, copper and quartz ores, run-of-mine coal.

Guaranteed TO HAVE GREATER RESISTANCE TO THE FOLLOWING:

Abrasion—Impact—Cutting—Tearing—Internal Rupture—Edgewear—Fastener Pull-out. It will not rot or deteriorate in strength due to moisture penetration. It is built to retain excellent troughing and cover adhesion. Downtime for stretch take-up is practically eliminated.

In building this new belting with a stronger ***Tensilized Nylon** carcass instead of the customary fabric carcass, Goodall offers the only basic improvement in conveyor belt construction in many years. It provides advantages that are virtually impossible with conventional constructions, all adding up to **longer belt life** under the severest load conditions ever encountered in any service. It will out-last the best conveyor belting you have ever used, and eliminate the usual costly downtime for repairs.

***Tensilized** (Oriented) **Nylon**, adapted to the manufacture of Conveyor Belting by Goodall Rubber Company, is produced by Spencer Chemical Co., and processed by Moldings & Extrusions, Inc.

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Whitehead Road, Trenton 4, N. J.
Please send complete information on "Long-Life" Tensilized Nylon Belting for handling
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Att. of__________________________

Contact our nearest branch or mail coupon for complete information. Be sure to state nature of material handled.

GOODALL *Rubber Company*

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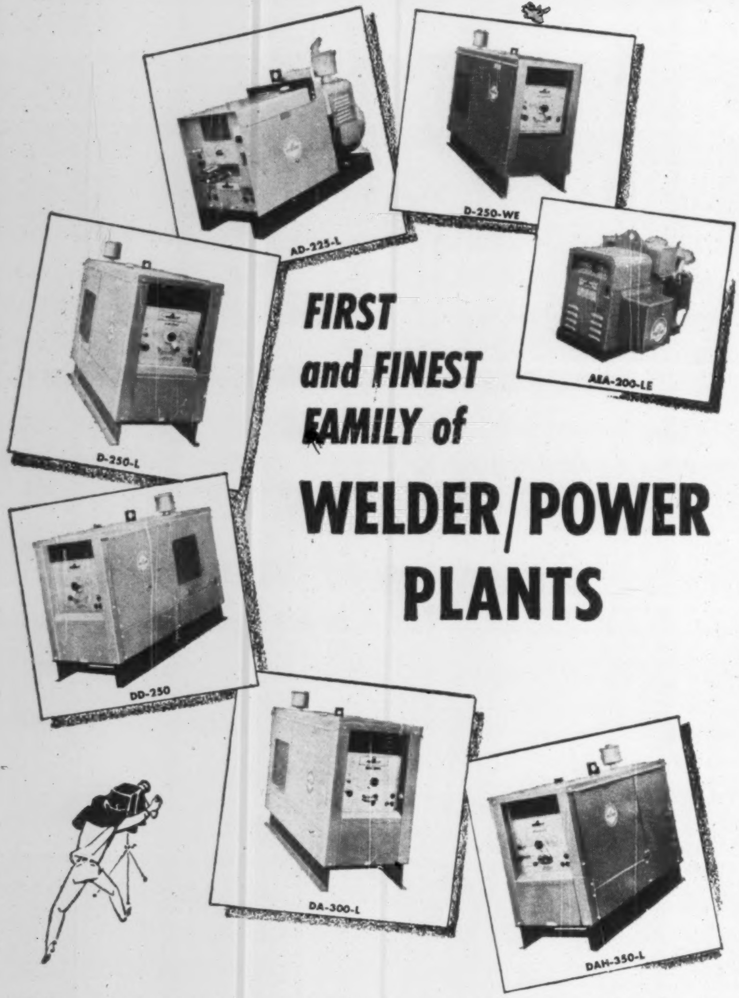
Manufacturers of Mechanical Rubber Goods Since 1870

CIRCLE 163 ON READER SERVICE CARD



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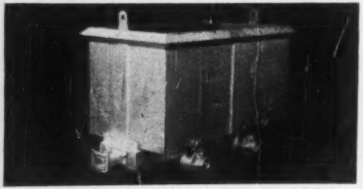
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TUNNEL AND MINE EQUIPMENT
Lancaster, Penna.

CIRCLE 41 ON READER SERVICE CARD

(Continued from page 161)

Charles H. Shook, Inc., 583 W. 2nd St., Dayton, O., CA **$718,631**, municipal POWER PLANT expansion, PIQUA, O. City, City Hall, Piqua, O.

▲ **R. Thomas Milord**, 9825 Crawford Ave., Evergreen Park, Ill., LB **$655,500**, general contract Hartigan ELEMENTARY SCHOOL, 4101 S. Federal St., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Fox & Fox, 30 N. LaSalle St., Chicago 2, Ill., archts. Bids Dec. 5. CD 11/21;
Miller-Davis Co., 4300 North Ave., Melrose Park, Ill., LB **$734,515**, (6 bidders), general contract Healy SCHOOL, 3037 S. Wallace St., (CHICAGO, ILL). Schmidt Garden & Erickson, 104 S. Michigan Ave., Chicago 3, Ill., archts.

▲ **Chell & Anderson, Inc.**, 5425 N. Kedzie Ave., Chicago, Ill., CA **$2,044,000**, 2 story OFFICE and PARKING, EVANSTON, ILL. Bd. Pensions, Methodist Church, 740 N. Rush St., Chicago, Ill. Perkins & Will, 309 W. Jackson Blvd., Chicago 6, Ill., archts. Bids Nov. 23.

▲ **J. A. Utley Co.**, 723 E. 10 Mile Rd., Royal Oak, Mich., CA fdns., concrete, brick work, etc., 212,500 sq. ft. ASSEMBLY PLANT addn., 7,550 sq. ft. RECEIVING DOCKS; 3,000 sq. ft. CAFETERIA facilities, 2,920 sq. ft. WASTE MATERIAL PLANT, WILLOW RUN, MICH. Geenral Motors Corp., Corvair Div., Geenral Motors Bldg., Detroit 1, Mich. Argonaut Realty Div., 485 W. Milwaukee, Detroit 1, Mich., archts.;
Whitehead & Kales Co., 58 Haltiner St., River Rouge 18, Mich., CA structural steel for 225,970 sq. ft. Assembly addn., Receiving Docks, cafeteria, etc. (Willow Run, Mich.);
Viking Sprinkler Co., 9900 Northlawn, Detroit, Mich., CA underground fire sprinkling sys. for Assembly Plant addns., etc. (Willow Run, Mich.).

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

† N. M, **Roswell**—WATER LINES—BA 12/27—U. S. Eng., P. O. Box 1538, Albuquerque, 35 mi. up to 4 in. water lines supply system for 12 sites, Walker Missile Base, Inv. No. ENG-29-005-61-45, $900,000. Plans deposit $10. CD 12/2.

▲† **Oklahoma**—BA 1/10—U. S. Eng., Box 61, Tulsa, Okla., relocating US Hy. 51, surf. and turfing 16.7 mi. roads, Keystone Reservoir, ENG-34-066-61-37, $2,000,000. Plans deposit $10. CD 11/29.

† Okla., **Oklahoma City**—MASONRY BUILDING—BA About 1/17—U. S. Eng., Box 61, Tulsa, Zone 1, 16,800 sq. ft. masonry bldg. for Radar Approach, Tinker Field, ENG-34-066-61-33, $300,000. Plans deposit $10. CD 7/26.

BUILDINGS—BA

Kan., **Belleville**—SCHOOL—BA 1/11—Bd. Educ., 1407 First St., 1 story, 40,000 sq. ft. High School between P. and S. Sts. south of 24 St. $435,000. Mid-States Archt. & Assoc., 5805 Reeds Rd., Mission, archts. CD 10/6.

▲† Mont., **Great Falls**—HOUSING—BA 1/26—Base Procurement Office, Malstrom Air Force Base, 300 unit Capehart Housing, Malstrom Air Force Base, $5,000,000. McIver & Hess, 603 Strain Bldg., Great Falls, archts. CD 2/19/59.

HEAVY CONSTRUCTION—LB & CA

Quaker Valley Constr. Co. Inc., Box B, Pittsburg, Kan., CA **$834,491**, combined bid, Sect. I, outfall sewers; Sect. II, main and lateral sewers and Sect. II, stabilization basin, EXCELSIOR SPRINGS, MO. City, City Hall, Excelsior Springs, Mo. Bids Oct. 20. CD 11/22, under LB.

† **Colby Steel & Mfg., Inc.**, 65 Horton St., Seattle 4, Wash., LB **$134,770**, intake gantry, power structure, Oahe Dam, Pierre, SOUTH DAKOTA. U. S. Eng., 215 N. 17th St., Omaha 2, Neb. Bids Dec. 6. CD 10/12.

▲† **J. A. Jones Constr. Co.**, 209 W. 4th St., Charlotte, N. C., and **Brown & Root, Inc.**, P. O. Box 3, Houston, Tex., CA **$17,461,900**, constr. power house substructure and intake on the Big Bend Dam and Reservoir, Missouri River, Fort Thompson, ENG-25-066-61-15, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaho 2, Neb. CD 11/17, under LB.

† **Cornell Constr. Co., Inc.**, Box 168, Clinton, OKLA., LB **$100,183**, est. $88,000, floodwater retarding structures, Sites 20, 22, 23A and 23B, Gageby Creek of Upper Washita River, near Wheeler, Inv. No. SCS-10-7X-61, TEXAS. Soil Conservation Service, Dpt. Agriculture, Temple, Tex. CD 11/7.

Fort Bend Telephone Co., Rosenberg, Tex., Owner Builds **$150,000**, modernizing, imprv., replacing rural pole telephone lines, Rosenberg, Fort Bend, TEXAS. CD 10/20.

Houston County Electric Cooperative, Crockett, Tex., Owner Builds, **$132,000**, pole transmission line extensions, transformers, Crockett, TEXAS.

Southwestern Electric Service, Merc. Bank Bld., Dallas, Tex., Owner Builds, **$110,000**, enlarged electric substation, at Lake Jacksonville, CD 2/10/58; **$275,000**, electric sub-station, Overton, TEXAS.

† **H & H Concrete Constr. Co.**, 5924 S. Staples St., Corpus Christi, Tex., LB **$97,365**, est. $175,000, repairs to asphalt Runways: 13-31, BEEVILLE, TEX. Bureau Yards & Docks, Dpt. Navy, Naval Auxiliary Station, Chase Field, Beeville, Tex. CD 11/7.

Harry Newton Constr. Co., P. O. Box 839, Graham, Tex., LB **$941,065**, est. $740,000, Beltwood Booster Pump Station and 10 MG reservoir cor. Intersection of Belt Line Rd. and Inwood Rd., DALLAS, TEX. City, City Hall, Dallas, Tex. CD 11/21.

City of Houston, Parks Dpt., City Hall, Houston, Tex., Owner Builds **$100,000**, hard-paved tennis courts, appurtenances, MacGregor Park. MacKie & Kamrath, 2713 Ferndale St., Houston, Tex., archts., CD 10/21; Owner Builds, **$100,000**, parks, playgrounds. CD 9/16/59; HOUSTON, TEX.

Burnett Constr. Co., 5702 S. Staples St., Corpus Christi, Tex., LB **$326,000**, Institute of Marine Science, appurtenances, boat basin, dredging, riprap, bulkheads, etc., PORT ARANSAS, TEX. University of Texas, Bd. Regents, Main Admin. Bldg., Austin, Tex. Bids Nov. 29. CD 11/10.

City of San Antonio, Dpt. P. Wks., City Hall, San Antonio, Tex., Owner Builds, **$118,000**, underground conduit storm drainage, Magnolia to W. Kings Hy., SAN ANTONIO, TEX. CD 5/7/59.

City P. Service Bd., 145 Navarro St., San Antonio, Tex., Owner Builds, **$400,000**, electric transmission lines on steel towers; **$200,000**, replacing gas pipe lines, SAN ANTONIO, TEX. CD 3/8/57.

▲ **R. H. Fulton & Co.**, 2323 Erskine Rd., Lubbock, Tex., CA Total est. Approx. **$3,845,000**, 10 in. line north of Billings, Mont., only for 433 mi. crude line, Cutbank, Mont. to Byron Wyo., MONTANA and WYOMING, Continental Pipeline Co., sub. Continental Oil Co., 1300 Main St., Houston, Tex. CD 11/2.

† **Materials, Inc.**, 500 Phoenix Ave., **Northwest, Albuquerque, N. M.**, LB **$391,428**, est. $470,260, (2 bidders), Middle Rio Grande Proj., channelization of Rio Grande, Albuquerque Area, Unit 1, Isleta, Bernalillo and Valencia Counties. Spec. DC 5432, NEW MEXICO. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Bids Dec. 6. CD 10/31.

BUILDINGS—LB & CA

Western Hills Development Co., 4301 Cach Rd., Lawton, Okla., Owner Builds, **$800,000**, 65 DWELLINGS, Santa Fe and Vic Sts. area, LAWTON, OKLA.

Humble Oil & Refining Co., Humble Div., Baytown, Tex., Owner Builds **$950,000**, CATALYTIC HYDROGEN TREATING PLANT ENLARGEMENT, BAYTOWN, TEX.

Melnick Constr. Co., 4226 Ross Ave., Dallas, Tex., CA **$110,000**, 1 story, brick, masonry, OPTICAL PLANT, DALLAS, TEX. Lone Star Optical Co., 519 S. Ervay St., Dallas, Tex. Craycroft & Eaves, 3400 University Blvd., Dallas, Tex., archts. Greenman & Strong, 2133 McKinney Ave. and Reed & Orr, 3405 Milton St., Dallas, Tex., engrs.

Trayor Boyce Associates, Inc., 1423 Chippendale St., Houston, Tex., Owner Builds, **$228,750**, PLANT, DAYTON, TEX. CD 10/5/59.

▲ **R. F. Ball Constr. Co., Inc.**, P. O. Box 2300, 1430 E. Houston St., San Antonio, Tex., LB **$2,627,888**, est. $2,220,000, (3 bidders), 170 Capehart HOUSING UNITS (Officers, Airmen, Families), INV-41-609-61-50, SAN ANTONIO, TEX. School of Aviation, Brooks Air Force Base, San Antonio, Tex. CD 11/9.

FAR WEST

HEAVY CONSTRUCTION—BA

Washington—BA 1/3—Chelan Co. PUD, 327 N. Wenatchee Ave., substation steel for Rocky Reach-Columbia No. 2 transmission line for Rocky Reach Hydro Proj. Stone & Webster, Lloyd Bldg., Seattle, Zone 1, engrs. CD 2/2/55.

Washington—BA 1/9—Grant Co. PUD Ephrata, extending transformer tracks at Priest Rapids Dam. CD 11/21/55.

† **California**—BA 1/12—Bureau Reclamation, Dpt. Interior, Redding, 156 in. butterfly valves for Clear Creek Powerplant and Spring Creek Powerplant, Trinity River Division, Central Valley Proj., Inv. No. DS 5455. CD 9/15/59.

† **California**—BA 1/17—Bureau Reclamation, Dpt. Interior, Redding, 158 in. butterfly valves for Trinity Powerplant, Trinity River Division, Central Valley Proj., Inv. No. DS 5458. CD 9/15/59.

† **Washington**—BA 1/17—U. S. Eng., City-County Airport, Walla Walla, drill and case 8 in. dia. well, 155 ft. deep, Ice Harbor Dam, CIVENG-45-164-61-25. Under $25,000. CD 10/3.

BUILDINGS—BA

† **Washington**—BARRACKS, etc.—BA 12/27—U. S. Forest Service, 729 NE Oregon St., Portland, Ore., 1 story, 24 x 44 ft. frame barracks, and 1 story, 28 x 62 ft. frame crewhouse, Quinault Ranger Station, Bid No. R6-61-143, Grays Harbor Co.

† **Ariz., Yuma**—HOSPITAL ADDN.—BA 1/4—Purchasing & Contracting Office, Yuma Test Station, construct hospital addn., Bldg. S-990, Yuma Test Station, IFB AVI-02-083-61-36B.

HEAVY CONSTRUCTION—LB & CA

UTAH—State Rds. Comn., State Capitol, Salt Lake City, Bids opened 12/6,

L. T. **Johnson Constr.**, Box 30, Ogden, Utah, LB **$122,118**, est. $150,120, 3 in. plant mix bit. surf. 0.986 mi. State Rd. 38. SP No. 1698, Weber Co. CD 11/16.

† **Wasatch Line Constr. Co.**, 1574 S. West Temple, Box 874, Salt Lake City, Utah, LB **$793,069**, est. $610,546, (5 bidders), furnish and constr. 43 mi. 138-kv wood-pole transmission lines from Flaming Gorge switch yard to Vernal, Utah Colorado River Storage Proj. Daggett and Uintah Counties, Spec. No. DC 5427, UTAH and WYOMING. Bureau Reclamation, Dpt. Interior, 53 Denver Federal Center, Denver, Colo. Bids Dec. 6. CD 10/27.

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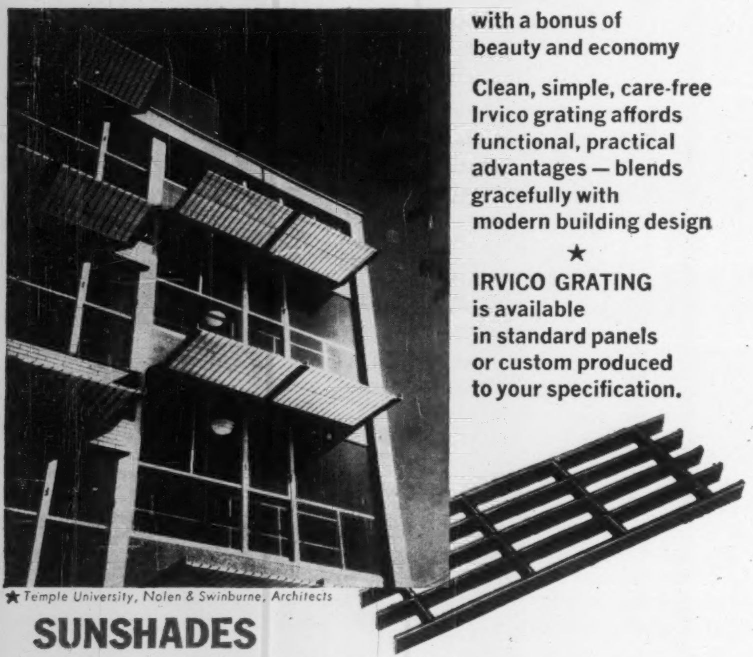
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† **U. S. Eng.**, 1519 S. Alaskan Way, Seattle 4, Wash., cancelled bids to have been opened Nov. 23, clearing Jackman Creek channel, Skagit River, Inv. 61-19, WASHINGTON. CD 11/11.

Chicago Bridge & Iron Co., White-Henry-Stuart Bldg., Seattle 1, Wash., LB **$84,952** (8 bidders), 2,400,000-gal. welded steel water storage tank, ALDERWOOD MANOR, WASH. Alderwood Water Dist., Alderwood Manor, Wash. Bids Dec. 5. CD 9/29.

National Constr. Co., 153 S. 160th St., Seattle, Wash., LB **$285,802**, 11,745 ft. **4- to 12-in. sewers,** Contract 1-A, SEATTLE, WASH. Lake City Sewer Dist., 12721 30th Ave. N.E., Seattle, Wash. Bids Dec. 5. Bids Oct. 24 rejected. CD 10/31, under LB.

▲† **Gibbons & Reed Co.**, 825 W. 9th St. N., Salt Lake City, Utah, and **G. Ball, Inc.**, 300 Camille Ave., Box 278, Danville, Calif., LB **$2,097,870** (3 bidders), runway and taxiway paving, Fairchild Air Force Base, Inv. 61-46, SPOKANE, WASH. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids Dec. 7. CD 11/29.

† **Westinghouse Electric Corp.**, 1414 N.E. Grand Ave., Portland 12, Ore., CA **$95,807, design,** mfg., deliver 27,000/36,000 kva OA/FA 6.6 115 kv, 3 phase power transformer, Hills Creek Powerhouse, CIVENG-35-026-60-20, OREGON. U. S. Eng., Pittock Block, Portland, Ore. CD 8/17, under LB.

† **U. S. Eng.**, 1519 S. Alaskan Way, Seattle 4, Wash., cancelled bids to have been opened Dec. 8, water supply facilities, Burns Air Force Station, Inv. 61-53, BURNS, ORE. CD 11/30.

R. A. Wattson Co., 12550 Saticoy St., North Hollywood, Calif., LB **$651,880**, est. $967,200 (5 bidders), Proj. 569, Unit 1, Lines A, E and I, Redondo Beach, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Dec. 2. CD 11/9.
K.E.C. Co., 22018 S. Norwalk Blvd., Artesia, Calif., LB **$228,624** (7 bidders), Proj. 414, Buena Vista Canyon Storm Drain, Monrovia-Duarte (Los Angeles, Calif.).

† **Richard K. W. Tom, Inc.**, 1930-A Ualakaa St., Honolulu, Hawaii, CA **$95,700**, VHF/UHF transmitter facilities, U. S. Naval Air Station, Barber's Point, Oahu, IFB NBy 28819, HONOLULU, HAWAII. Dist. P. Wks. Office and Officer in Charge of Constr. 14th Naval Dist., Navy No. 128, Box 94 F.P.O., San Francisco, Calif. CD 8/2.

BUILDINGS—LB & CA

Tietz Constr. Co., 11900 Gilbert, Garden Grove, Calif., Owner Builds, **$510,000**, stucco MOTEL, 710 W. Katella. ANAHEIM, CALIF.

Pacific Sands, 20470 Beach Blvd., Huntington Beach, Calif., Owner Builds, **$643,240**, 52 DWELLINGS, Indianapolis Ave., Tract 3595, HUNTINGTON BEACH, CALIF.

Coyle & Higginson, 5812 Kauffman Ave., Temple City, Calif., LB **$536,100** (12 bidders), LaSeda SCHOOL, LA PUENTA, CALIF. Rowland Union School Dist., 736 N. Grandview Lane, La Puente, Calif. Bids Dec. 1. CD 11/17.

▲ **Horizon Constr. Co.**, 17759 E. Valley Blvd., La Puenta, Calif., CA **$1,060,000**, 106 frame, stucco DWELLINGS, Tract 1113, NEWBURY PARK, CALIF. Louis Lesser Enterprises, 17759 E. Valley Blvd., La Puente, Calif.

▲ **Crestlane Bldg. & Investment, Inc.**, 13045 Ventura Blvd., North Hollywood, Calif., Owner Builds, **$1,370,000**, 2 stucco APARTMENTS, 4230 and 4250 Fullton Ave., NORTH HOLLYWOOD, CALIF.

▲ **Sherlock Homes, Inc.**, 3332 Orange St., Riverside, Calif., Owner Builds, **$1,500,000**, 139 DWELLINGS, Tract 3632, ORANGE, CALIF.

▲ **General Electric Co.**, Atomic Power Equipment Dpt., 2151 S. 1 St., San Jose, Calif., Owner Builds, **$8,000,000** SUPERHEAT DEVELOPMENT REACTOR at Vallecitos Atomic Laboratory, PLEASANTON, CALIF. CD 2/15/59.

Herwig Corp., 871 East Hamilton Ave., Campbell, Calif., LB **$461,769** (6 bidders), general contract 37,800 sq. ft. AERONAUTICS BLDG., San Jose Municipal Airport, for San Jose State College, W.O. 4160GC-54, SAN JOSE, CALIF. State Div Architecture, 1120 N St., Sacramento, Calif. Bids Dec. 6 CD 11/16.

Galaxy Dev. Co., Inc., 12435 Oxnard St., North Hollywood, Calif., Owner Builds, **$411,200** stucco APARTMENTS, VAN NUYS, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

Ont., Port Arthur—HARBOUR IMPRVS.—BA 1/11—Dpt. P. Wks., Hunter Bldg., Ottawa, Lakehead Harbour imprvs., Stage 6, Main St. access bridge, Dist. of Thunder Bay, Over $100,000. Plans deposit $100. CD 3/8.

▲ **Manitoba**—BA 1/12—Manitoba Hydro Electric Bd. P. O. Box 815, Winnipeg, Grand Rapids Generating Station, Total est. $140,000,000. Plans deposit $100. CD 2/8.

BUILDINGS—BA

▲ **Que., Louiseville**—HOME FOR AGED—BA 1/12—Provincial Dpt. Social Welfare, Parliament Bldgs., Quebec City, 2 story, 4 wings, 44 x 226 ft., brick Home for Aged. $1,250,000. Jean Charles Fortin, 465 Victoria St., Suite 201, St. Lambert, archt. CD 11/29.

HEAVY CONSTRUCTION—LB & CA

▲ **Prairie Constr. Co., Ltd.**, St. Boniface, Man. CA camp buildings, hospital bldg., houses for Grand Rapids Hydro-Electric Proj., Grand Rapids, MANI-

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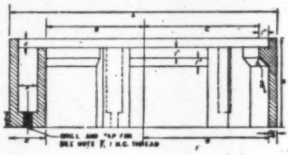

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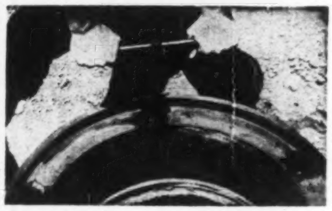

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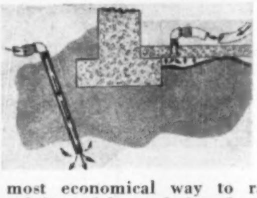

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TOBA, Manitoba Hydro Electric Bd. Box 815, Winnipeg, Man. CD 4/28;

Drake Constr. Co., Ltd., 155 M-1485 Portage St., and **Simkins Constr. Co., Ltd.**, Andrews and Jarvis Sts., both Winnipeg, Man. CA, water and sewage services, Hydro-Electric Development Proj., Grand Rapids (MANITOBA).

▲ **Pearson Constr. Co., Ltd.**, 1019 Erin St. and **Drake Constr. Ltd.**, 155 M-1485 Portage St., both of Winnipeg Man., CA **$3,500,000**, transport materials, supplies and equipment for Hydro-Electric Development, Grand Rapids, MANITOBA. Manitoba Hydro Electric Bd., Box 815 Winnipeg, Man. CD 2/8.

QUEBEC—Provincial Dpt. Rds., Parliament Bldgs., Quebec City,

Regional Constr. Co., Plage Hemmingford, Huntingdon Co., Que. CA **$102,539**, bit. pavement, Chateauguay Co. St. Malachie.

BUILDINGS—LB & CA

▲ **T. A. Andre & Sons, Ltd.**, 580 Brock St., Kingston, Ont. CA **$1,104,815**, alterations Douglas Wing at Kingston General HOSPITAL and Richardson Laboratories, Queens University, KINGSTON, ONT. Kingston General Hospital Bd. Governors, Kingston, Ont. Awarded Dec. 5. CD 11/29, under LB.

▲ **Good Luck Constr. Ltd.** c/o M. Fishtein, 160 Overbrook Pl., Toronto, Ont., Owner Builds **$2,000,000**, SHOPPING CENTRE, and 16,000 sq. ft. OFFICE above, APARTMENT Proj. etc., Brimley Rd. and St. Clair Ave., TORONTO, ONT. E. J. Simpson, 705 A Lawrence Ave. W., Toronto, Ont., archt.

Lou Lanys, 70 Delia Court, Toronto, Ont., Owner Builds, **$500,000**, 5 story, masonry APARTMENT, Lawrence Ave., TORONTO, ONT. Peter Dimitroff, 828 Kingston Rd., Toronto, Ont., archt.

PROPOSED PROJECTS

WATER SUPPLY

▲ N. M., **Carlsbad**—City, City Hall, 5 m.g. water reservoir, **$600,000**; 30 mi. 12- to 30-in. water lines, **$1,800,000**. Arthur B. Chafetz, Box 909, Carlsbad, consult. engrs. Bids late Dec. 1960. CD 4/2/53.

▲ O., **Cleveland**—City, City Hall, Zone 14, 4 mi. Engle Rd. water main. **$1,300,000**. Havens & Emerson, 640 Leader Bldg., Zone 14, consult. engrs. Bids soon. CD 12/17/58.

O., **Columbus**—City, City Hall, Zone 15, 2nd phase, Stelzer Rd. water lines, 7th to Livingston Aves., extending Hoover Dam water to citys east side, **$900,000**. Burgess & Niple, 2015 W. 5th Ave., consult. engrs. Bids in January. CD 2/12.

SEWERS, WASTE DISPOSAL

▲ **Ill., Monsanto (East St. Louis P.O.)**—Village, Village Hall, sewers, sewage treatment plant auxiliaries and appurtenances, **$5,000,000**. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. for survey. Joseph W. Goldenberg, 624 A Missouri Ave., East St. Louis, owners' engr. CD 2/9.

▲ Ky., **Bowling Green**—City, City Hall, sewer extensions, treatment plant. **$4,346,000**. Chester Engineers, 601 Suisum St., Pittsburgh 12, Pa., engrs. Bids 1961-1962. CD 11/28.

▲ **Mich., Pontiac**—City, City Hall, sewage treatment plant. **$3,300,000**. Bids about July 1, 1961.

B. C., **White Rock**—City, City Hall, sewerage system extensions, incl. 63,300 ft. sewers, 1,540 ft. force mains, pumping station. **$720,000**. Hunter, Douglas & Crockford, 26 Lorne Ave., New Westminster, consult. engrs. CD 2/18/59.

BRIDGES

▲ **PENNSYLVANIA**—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,

Lancaster and York Counties—bridge over Susquehanna River between Lancaster and York Counties, below Holtwood Dam, vicinity of Piney and Bear Islands, to connect T.R. 372, Lancaster County, and T.R. 74, York County. **$5,000,000**. Buchart Engineering Corp., 611 W. Market St., York, Pa., engr. for location study. Site changed. CD 10/31/58.

STREETS AND ROADS

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15,

Tuscarawas Co.—relocating 2.4 mi. Rte. 39 around Roswell, **$700,000**.

13.8 mi. Interstate Rte. 77, Dover to Stark Co. line **$17,500,000**. Constr. during next five years.

EARTHWORK, WATERWAYS

D. C., **Wash.**—Redevelopment Land Agency, 919 18th St. N.W., bulkhead and pier lines along Maine Ave. between 11th and M Sts. S.W., **$900,000**. Ewin Engineering Assocs., 5104 MacArthur Blvd. N.W., consult. engrs.

▲† **Kentucky**—U. S. Eng., P. O. Box 59, Louisvlle, Zone 1, 1,200,000 cu. yd. earth and rockfill, 700,000

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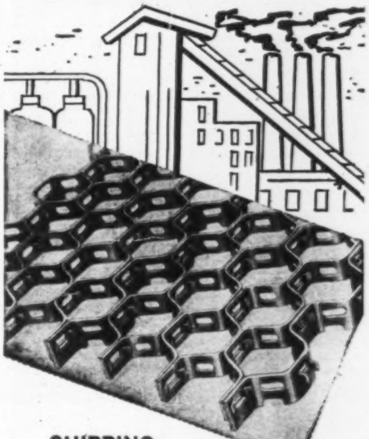

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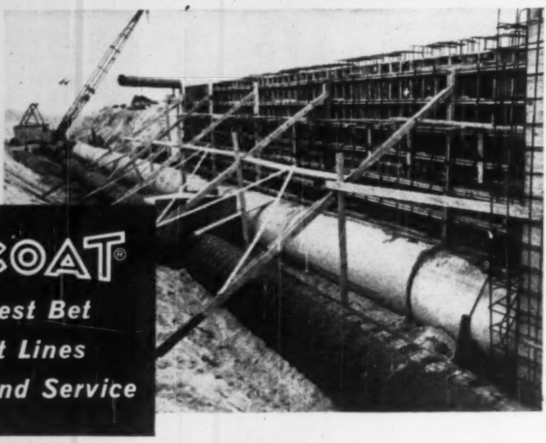

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cu. yd. spillway, Dam-Nolin River Reservoir, Edmonson Co. **$3,000,000;** relocation 4 mi. State Hy. 1214 incl. bridges, Over **$1,500,000;** relocation 2.3 mi. Ky. State Hy. 88 and relocation bridges over Nolin River and Rock Creek, Over **$1,000,000;** relocation 2 mi. various County Roads adjacent to Nolin River Reservoir, Over **$500,000;** 2 bridges and relocation 1 mi. State Hy. 728, Can Run Creek, Bacon, Over **$200,000.** CD 9/20.

▲ **Massachusetts**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston, relocation Charles River Dam to Warren Ave., Charlestown. **$5,000,000.** Constr. 1961.

AIRPORTS

▲† **Calif., Point Mugu**—MISSILE LAUNCH, etc.—Dist. P. Wks. Office, Eleventh Naval Dist., 1220 Pacific Hy., San Diego, 1st Phase, probe missile launch complete, incl. central pad, launch building, access road and related facilities, Pacific Missile Range, Point Arguello. Kaiser Engineers, 300 Lakeside Dr., Oakland Zone 12, consult. engrs. CD 9/25/59.

▲ **Mich., Detroit**—AIRLINE TERMINAL, etc.—Wayne County Rd. Comn., 726 City-County Bldg., Zone 26, airline terminal and terminal addn., **$15,000,000,** Bids sometime in 1961; four hangars for various Air Lines, Detroit Metropolitan Airport, Romulus, **$9,250,000.** Bids sometime in 1961. CD 11/9/56.

Tex., Dallas—RUNWAY—City, Airport Div., City Hall, 9,400 lin. ft. parallel runway, Love Field, **$740,000.** Forrest & Cotton, 600 Vaughn Bld., consult. engrs. CD 7/12/57.

UNCLASSIFIED

▲ **Tex., Dallas**—TELEPHONE SYSTEM—Southwestern Bell Telephone Co., 308 S. Akard St., 4 steel antennae 250 ft., Bryan and Haskell Sts., for microwave radio long-distance telephone system, **$1,500,000.**

▲ **Va., Norfolk**—COAL PIER, etc.—Norfolk & Western Railway Co., A. B. Stone, ch. engr., 8 N. Jefferson St., Roanoke 1,380 ft. x 83 ft. coal pier, concrete piles, rein.-con. deck, conveyor feed system, traveling shop loader, scales car repair facility, **$19,000,000;** general cargo terminal, warehouses, wharves, cargo handling facilities, **$16,000,000.** CD 11/28.

▲ **Wyoming**—CRUDE PIPE LINE—Belle Fourche Pipeline Co., Box 1612, Casper, 103 mi. 8 in. crude pipe line, Fidler Creek Field to Lance Creek. **$1,900,000.**

PUBLIC BUILDINGS

Ark., Batesville—FACTORY—Batesville Chamber of Commerce, and City, City Hall, voted bonds Nov. 29, 1 story, 20,000 sq. ft. factory bldg., (first Stage) Ark., Hy. 69, east of here. **$300,000-$800,000,** Configured Tube Products Co., subsidiary White-Rodgers Co., 1209 Cass Ave., St. Louis, Zone 6, Mo., lessee. CD 11/17.

▲ **Ark., Little Rock**—TREATMENT BLDG., etc.—State Hospital for Nervous Diseases, Markham and Elm Sts., plans by Wittenberg, Delony & Davidson, 510 Center St., (1) intensive treatment bldg. (2) kitchen, **$1,500,000.** CD 1/29/50.

▲† **Calif., Bakersfield**—FEDERAL OFFICE—General Services Admin., 19 and F Sts. N. W., Wash., D. C., plans by Eddy & Paynter, 2901 H St., federal office. **$1,500,000.** CD 2/5.

▲ **Calif., Campbell**—SCHOOL—Campbell Union High School Dist., 151 N. Winchester Rd., plans by Clark, Stromquist, Potter & Ehrlich, 3200 Hanover St., Palo Alto, Calif., 113,000 sq. ft. wood frame and stucco Leigh High School. **$2,000,000.** Bids Jan. 15. CD 10/26/59.

Calif., Crescent City—HOSPITAL ADDN.—Del Norte County Hospital Dist., c/o Adminstrator, c/o Matson & Nielsen, archts. 3234 T St., Eureka, 2 story, rein.-con. Seaside Hospital addn. **$750,000.** Bids August 1961.

▲ **Calif., Lafayette**—SCHOOL—Acalanes Union High School Dist., 1212 Pleasant Hill Rd. **$3,900,000,** bond election Feb. 14, 5th High School at Rheem Center, Moraga; completion of Del Valley and Miramonte Schools and Acalanes and Los Lomas High Schools addns. CD 12/7/55.

▲ **Calif., Los Angeles**—CENTRAL BOILER PLANT—Los Angeles Co., 500 N. Temple St., central boiler plant, Los Angeles General Hospital. **$1,400,000.**

▲ **Calif., Los Angeles**—POLICE HEADQUARTERS—City, City Hall, plans by Daniel, Mann, Johnson & Mendenhall and Larsen, Kahn & Farrel, 3325 Wilshire Blvd., 3 story, rein.-con. police headquarters, Van Nuys. **$5,000,000.**

▲ **Calif., Martinez**—ADMINISTRATION—Contra Costa County, County Bldg., plans by Confer, Willis & Anderson, 365 40 St., Oakland, county administration bldg. **$2,000,000.** Bids in March.

Colo., Brighton—SCHOOL—School Dist. No. 27-J, Adams County, 270 S. 8th St., $1,700,000 bond election Jan. 10, for Junior High School, **$805,000,** Atchison, Kloverstrom, Saul & Atchison, 257 Josephine, Denver, archts., grade school, **$525,000,** Carl C. Morris, 122 E. 18th Ave., Denver, archt. Extended bond election. CD 11/18.

▲† **Conn., Groton**—CAPEHART HOUSING—Dist. P. Wks., 3rd Naval Dist., 90 Church St., New York 7, N. Y., 400 units Capehart Housing, U. S. Naval Submarine Base, Gungywamp Rd., Pleasant Valley, (third project). **$6,000,000.**

▲ D. C., **Wash.**—APARTMENT—National Capital Housing Authority, 1729 New York Ave., N.W., plans by Brown, Chapman, Miller & Wright, 1640 Wisconsin Ave. N.W., 230 unit Eastgate Gardens, apartment project at Fitch St., Benning Rd., F, G and 51st Sts., S.E., Proj. 1-38. **$2,300,000.** CD 12/2.

† Ga., **Athens**—RESEARCH—General Services Admin. 19 and F Sts. N.W., Wash., D. C., plans by Toombs, Amisano & Wells, 70 Fairlie St. N.W., Atlanta, two 29,300 sq. ft. concrete research buildings, for Poultry disease laboratory complex, University of Georgia. **$950,000.**

Ill., **Antioch**—HIGH SCHOOL—Antioch Twp. High School Dist., 1133 S. Main St., 2 story high school addn., **$995,000.** CD 10/27/59.

Ill., **Riverdale**—SCHOOL—School Dist. No. 133, 137th Pl. and State St., voted bonds Bowen School, 137th St. and Tracy. **$755,000.** William J. Connor & Assocs., 164 E. 154th St., Harvey, archts. CD 9/28.

▲ Ind., **Crawfordsville**—POWER PLANT—City, City Hall, first phase, expanding municipal power plant, incl. 12,650 kw. turbo generator, boiler. **$3,150,000.** Emery, Marker & Campbell, Toledo Trust Bldg., Toledo, O., consult. engrs. CD 11/16.

▲ Ind., **Muncie**—RESIDENCE—Ball State Teachers College, Admin. Bldg., 3 story, 450 men residence hall, 3 story, 450 women residence hall. Over **$2,000,000** each. Bids in 1961.

Iowa, **Rockford**—SCHOOL—Rudd-Rockford-Marble Rock Common School Dist., voted bonds Nov. 30, Senior High School. **$750,000.** Woodburn & O'Neil, 201 Jewett Bldg., Des Moines, archts. Constr. about April. CD 11/25.

▲ Mich., **Centerline**—SCHOOLS—Centerline Bd. Educ., 26300 Arsenal Ave., voted **$2,500,000** bonds Nov. 28, two elementary schools, high school and school addns. Linn Smith, Assoc., 894 S. Adams Ave., Birmingham, archts. Bids in February. CD 6/18/57.

Minn., **Anoka**—HOSPITAL—Anoka Community Hospital, Inc. plans by Toltz, King, Duvall, Anderson & Assocs., Inc., 1509 Pioneer Bldg., St. Paul, municipal hospital, Douglas St., State Ave., Park St. and Green Ave. **$800,000.** J. A. Hamilton Assocs., 425 S. E. Harvard St., Minneapolis, assoc. archts. CD 10/10/56.

▲ Minn., **Mounds View**—SCHOOLS—Bd. Educ. Independent School Dist. No. 261, voted **$2,400,000** bonds Nov. 29, schools. Bissell, Belair & Green, 1111 Nicolett Ave., Minneapolis, archts. CD 11/4.

▲ Mo., **Maryville**—SCHOOL—Maryville R-II School Dist. Bd. Educ., defeated **$1,317,300** bonds Nov. 22, high school. CD 11/23.

▲ Mo., **Wellston (St. Louis 12 P. O.)**—SCHOOL—Wellston School Dist., 6301 Wells Ave., Zone 12, $1,650,000 bond election Jan. 28, elementary school to replace Central School, 6240 Ella Ave. **$690,000;** high school. **$900,000.** CD 2/10/59.

▲ Neb., **Lincoln**—HOSPITAL—Bd. Comrs. Lancaster Co., Courthouse, plans by Clark & Enersen, 1415 Sharp Bldg., Lancaster County Convalescent Hospital, 2315 South 17th St. **$1,100,000.** CD 5/20.

▲ N. J., **Bayville**—Ocean Co. Central Regional High School Dist., voted referendum Nov. 29, high school addn., Berkeley Twp. **$1,595,000.** Ernest Brown, 7 Watchung Ave., Plainfield, N. J., archt. CD 8/22.

▲ N. J., **Cresskill**—HIGH SCHOOL—Bd. Educ. Borough Cresskill, Dogwood Lane, referendum bonds and project Jan. 24, high school, north site. **$2,400,000.** Warren Ashley, 740 N. Main St., West Hartford, Conn., archt. CD 9/28.

N. J., **Franklin Lakes**—SCHOOL—Bd. Educ. Boro Franklin Lakes referendum bonds and project Jan. 25, elementary school, High Mountain Rd. **$840,000.** Emil Schmidlin, 50 Evergreen Pl., East Orange, N. J., archt. CD 11/22.

▲ N. J., **Jersey City**—PRODUCE MARKET—New Jersey P. Market Comn., 2857 Hudson Blvd., produce market, Tonnelle Ave., Paterson Plank Rd. and Secaucus Rd. **$25,000,000.** Alex Herenchak, Barnett & Herenchak, 20 Clinton St., Newark, consult. engrs. To commence January-February 1961. Target for completion January 1963.

▲ N. J., **Newton**—HIGH SCHOOL—Walkill Valley Regional High School Dist. Sussex County, Service Bldg., 18 Church St., referendum bonds and project Feb. 14, high school (site not selected). **$1,250,000.** (Correction—owner). CD 12/1, under N. J., Sussex.

▲ N. J., **Point Pleasant**—HIGH SCHOOL—Bd. Educ. defeated referendum Nov. 29, high school. **$2,650,000.** CD 10/14.

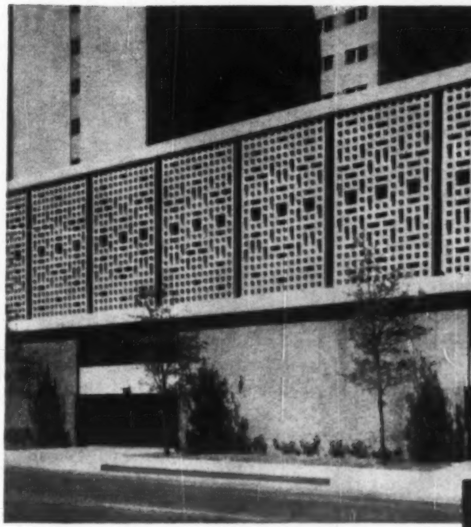
N. Y., **Amherst**—SCHOOL—Sweet Home Central School Dist., 1901 Sweet Home Rd., referendum Dec. 19, Maplemere Elementary School. **$950,000.**

▲ N. Y., **Flushing**—SCHOOL—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, Proj. E-502, Central Queens High School, vicinity Main St. and Horace Harding Blvd., Queens Boro. **$7,000,000.** Constr. 1961.

▲ N. Y., **Laurelton**—SCHOOL—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, P.S. 181, Queens Boro. **$1,500,000.** Constr. 1962.

▲ N. Y., **Locust Valley**—SCHOOL, etc.—Bd. Educ. Central School Dist. No. 3, Horse Hollow Rd., voted **$4,397,500** bonds Junior-Senior High School; defeated **$200,000** bonds Natatorium. Eggers & Higgins, 100 East 42 St., New York, N. Y., archts. CD 11/23.

▲ N. Y., **Ozone Park**—SCHOOL—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, Proj E-542 Junior High School 202, North Conduit



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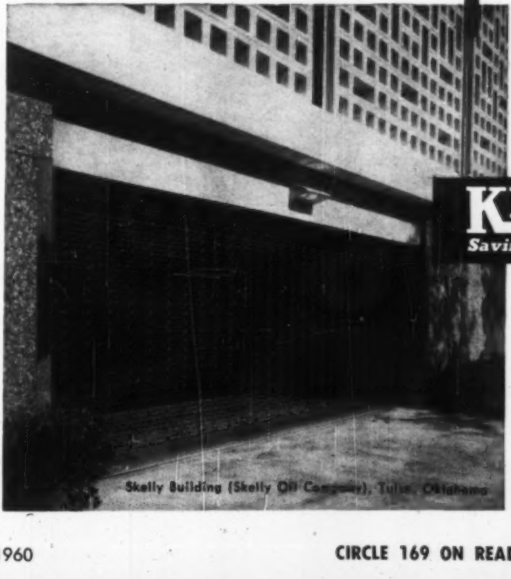
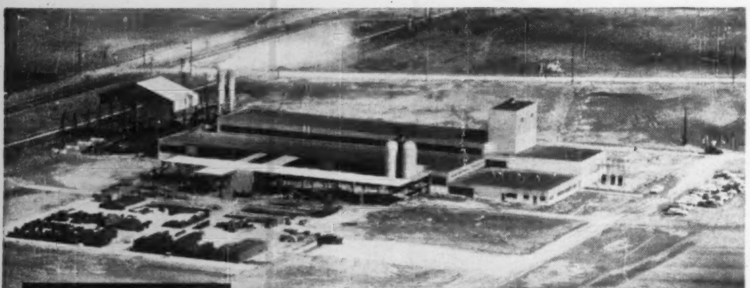


Skelly Building (Skelly Oil Company), Tulsa, Oklahoma



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Ave. and 149 Ave., Queens Boro. **$3,600,000.** Constr. 1961.

▲ **N. Y., Queens Village**—SCHOOL—Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City, Zone 1, Martin Van Buren High School addn., E 548 Hillside Ave. and 229 St., Queens Boro. **$1,500,000.** Constr. 1961.

▲† **N. Y., Rome**—HOUSING—Base Procurement Office, Griffiss Air Force Base, Rome, N. Y., plans by Pedersen & Tilney, 155 Whitney Ave., New Haven, Conn., 135 units Capehart Housing, Griffiss Air Base. **$2,200,000.** George J. Lederer, 92 So. Central Ave., Hartsdale, consult. engr. CD 5/9.

▲ **O., Cincinnati**—SCHOOL—Lincoln Heights Bd. Educ., Magee St., Lincoln Heights, Cincinnati, plans by W. L. Mangrum Jr., Box 186, RR 1, Batavia, elementary school, Lockland. **$2,500,000.** E. A. Sobolewski, 309 Ludlow Ave., consult. engr. CD 11/14.

▲ **O., Cleveland**—EXPOSITION HALL—City, City Hall, Zone 14, plans by Outclat, Guenther & Van Buren, 13124 Shaker Sq., Zone 20, underground exposition hall. **$10,000,000.** CD 11/14.

▲ **O., Maple Heights**—HIGH SCHOOL—Bd. Educ., 5500 Clement Dr., plans by Lesko Assocs., 1404 E. 9th St., Cleveland, Zone 14, high school. **$2,921,000.** CD 11/14.

O., North College Hill (Br. Cincinnati)—SCHOOL—North College Hill Bd. Educ., 1498 W. Galbraith St., plans by A. M. Kinney, Inc., archt.-engr. 2910 Vernon, St., Cincinnati, Clovernook Elementary School addn., elementary school Steele Elementary School alterations, high school alterations. **$995,000.**

▲ **Pa., Bloomsburg**—SCHOOL—Central Columbia County Joint School Dist., R. D. 5, plans by Edmund George Good, 904 N. 2nd St., Harrisburg, Secondary School, **$2,300,000.** CD 3/31.

▲ **Pa., Clearfield**—SCHOOL—Clearfield Area Joint School Dist., secondary school bldg., (Proj. 724). **$2,500,000.** CD 6/7.

▲ **Pa., Greensburg**—SCHOOL—Greater Greensburg Jt. School Dist. plans by Bartholomew, Roach Moyer and Walfish, Couller Bldg., Main St., secondary school bldg., Proj. 703, **$4,000,000.** Bids soon. CD 11/6/59.

▲ **Pa., Monroeville**—SCHOOL—Monroeville-Pitcairn Jt. School Dist., secondary school, Proj. 992, Allegheny, **$2,000,000.**

▲ **Pa., Newtown**—SCHOOL—Council Rock Jt. School Dist., secondary school, Proj. 977, **$1,500,000.**

▲ **Pa., Pittsburgh**—HOUSING—Allegheny County Housing Authority, Frick Bldg. Annex, two 3 story and eight 2 story housing project, Grandview Ave., Wilkins Twp. and Turtle Creek. **$1,544,422.**

▲ **Va., Norfolk**—COURTS etc.—City, City Hall, Courts bldg., Norfolk Civic Center, courts and court office, Over **$1,000,000.** Bids 1961 or 1962.

▲ **Wash., Aberdeer**—SCHOOL—School District No. 5, 1001 Summit, plans by R. B. Price, 2907 A St., Tacoma, high school. **$1,500,000.** CD 11/17.

▲ **Wash., Kennewick**—SCHOOL—School District 17, 500 S. Dayton, plans by J. S. Villesvik, 109 N. 3 St., Yakima, Junior High School. **$1,215,000.** CD 9/23.

▲ **Wash., Renton**—SCHOOL—School District 403, 1525 4 Ave. N., plans by Mallis & DeHart, Lyon Bldg., Seattle, Zone 4, Junior High School in Spring Glen area. **$1,000,000.** CD 9/23.

Wis., Brussels—HIGH SCHOOL—Joint 1 Southern Door County Dist., plans by R. N. LeVee & Assocs., 1000 E. College Ave., Appleton, high school. **$800,000.**

Wis., Delavan—VOCATIONAL AND ELEMENTARY SCHOOL—State Dpt. P. Welfare, 1 Wilson St., Madison, plans by Darby, Bogner & Assocs., 8801 W. National Ave., West Allis, vocational and elementary school. **$749,000.**

Wis., Port Washington—HOME FOR AGED—Ozaukee Co., Courthouse, Home for Aged. **$900,000.**

Wis., Wisconsin Rapids—SCHOOL—Bd. Educ., plans by Rowland Assocs., Wisconsin Rapids, Lincoln High School addn. **$850,000.**

▲ **Ont., Cooksville**—HOSPITAL—South Peel Hospital 100 Upper Middle Rd., plans by Chester C. Woods, 2842 Bloor St. W., Toronto, T-shaped, 5 and 6 story hospital addns. **$4,846,000.** CD 3/10.

Ont., Ottawa—SCHOOL—Public School Bd., 330 Gilmour St., plans by Craig, Madill, Abram & Ingleson, 111 Sparks St., school, Ryan Farm. **$840,000.**

Ont., Toronto—SCHOOL—Etobicoke Bd. Educ., 540 Burnhampthorpe Rd., plans by Craig, Madill, Abram & Ingleson, 290 Merton St., North Albion Secondary School. **$800,000.**

▲ **Que., Montreal**—PROVINCIAL BLDG., etc.—Dpt. P. Wks., Parliament Bldgs., Quebec City, plans by Robillard, Jette, Baudoin, 10310 Cartier St., 13 story provincial bldg., police headquarters, Fullum, Logan and Parthenais Sts, **$3,000,000.** CD 12/6.

▲ **Que., Montreal**—PROVINCIAL BUILDING, etc.—Dpt. P. Wks., Parliament Bldgs., Quebec City, plans by Jean A. Gelinas, 1005 Sherbrooke St. W., 13 story provincial bldg., police headquarters etc., Fullum, Logan and Parthenais Sts. **$3,000,000.**

▲ **Wyo., Green River**—SCHOOL—School Dist. No. 2, constr. Junior-Senior High School, **$1,000,000.**

COMMERCIAL BUILDINGS

▲ **Colo., Lakewood**—MEDICAL ARTS—Owner, c/o Murrin, Kasch, Kahn & Assocs., archts., 1654 Grant, Denver, 6 story, 60,000 sq. ft. Medical Arts Bldg., 17th and Wadsworth Blvd. **$1,000,000.**

▲ **Conn., Greenwich**—SCHOOL—Greenwich Academy, 116 N. Maple Ave., plans by Sherwood, Mills & Smith, 65 Broad St., Stamford, school, gymnasium, cafeteria, 200 N. Maple Ave. **$1,680,000.** CD 6/1.

▲† **Conn., Groton** — SUBMARINE MEMORIAL, etc. — U. S. Submarine Veterans of World War 2, c/o Louis J. Drakos, archt., 998 Farmington Ave., West Hartford, submarine memorial at U. S. Naval Submarine Base, library, auditorium, chapel, museum, dock. **$2,000,000.**

Conn., Unionville—HOUSES—Howard L. Menzel, Inc., Tanglewood Rd., Farmington, 80 houses, The Highlands. **$800,000.**

▲ **Conn., Wallingford** — HOUSES — Ahearn Development Co., E. Center St., 50 houses, Longhill, Ward and Center Sts. areas. **$1,250,000.**

▲ **Ga., Atlanta**—OFFICE—Bankers Fidelity Life Insurance Co., 1330 W. Peachtree St. N.W., plans by Edwards & Portman, 153 Peachtree St. N.W., 7 story rein.-con. frame office. **$1,500,000. (Correction—status-preliminary plans only. No contract awarded).** CD 12/1, under CA.

▲ **Hawaii, Honolulu**—APARTMENT—Alan Sanford Davis, 1001A Wilder Ave., plans by Edwin L. Bauer, 1521 South King St., 12 story, 287 unit cooperative apartment, parking garage and three swimming pools. **$6,500,000.** R. M. Towill Corp., 233 Merchant St., consult. engrs.

▲ **Ill., Aurora**—OFFICE—Northernn Illinois Gas Co., 50 Fox St., office, East-West Tollway & Ill. 59. **$2,000,000.**

▲ **Ill., Deerfield**—BAKERY—Sara Lee Kitchens, 5353 Ridge Ave., John J. Louis Memorial Pavilion **$1,400,000.**

Ill., Evanston—HOSPITAL—Evanston Hospital, 2650 Ridge Ave., John J. Louis Memorial Pavilian Hospital. **$800,000.**

▲ **Ill., Granite City** — HOSPITAL — Sisters of Divine Providence, St. Elizabeths Hospital, 2100 Madison Ave., hospital remodeling, imprvs. **$1,300,000.** Bids in 1961 and 1962.

▲ **Ind., Fort Wayne**—APARTMENT—Jack Golden & Assocs., 1208 Delta St. plans by A. M. Strauss & Assocs., Strauss Bldg., 10 or 12 story executive-suite type apartment along St. Marys River near Layfayette St. bridge. **$1,500,000.** Bids middle 1961.

▲ **Md., Rockville** — APARTMENT — Merrimack Constr. Corp., 4916 Del Ray Ave., Bethesda, Md., plans by Cohen, Haft & Assoc., 7961 Eastern Ave., Silver Spring, 160 unit apartment, Congressional Airport Lane and Jefferson St. **$1,120,000. Bids Spring 1961.**

▲ **Md., Takoma Park**—APARTMENT—Carl M. Freeman, 1111 Fidler Lane, Silver Spring, Section II, 164 unit apartment, Americana Park, New Hampshire Ave. and Metzerott Rd. **$1,640,000.** Bids March 1961.

▲ **Mass., Attleboro**—RETREAT HOUSE, etc.—LaSalette Shrine Park St., plans by Rev. Brother Cajetan Baumann, JB-OFM 44 Whitehall St., New York, N. Y., retreat house, cafeteria and hall, religious articles store, monastery and novitiate, shrine church and guest house. **$2,000,000.** Constr. 1961 and 1962.

▲ **Mich., Dearborn**—BOWLING ARENA—Detroit Bowling Club, of Dearborn, 806 Fisher Bldg., Detroit, Zone 1, bowling arena and facilities, Michigan and Greenfield Aves. **$2,000,000.** Bids in about thirty days.

▲ **Minn., St. Louis Park**—APARTMENTS—N. Moushou & Assocs., c/o G. Kolinsky, archt., 7711 6. Ave. N., Minneapolis, three 6 story, 47 unit apartments, Hy. No. 7 and Ottawa Ave. **$2,000,000.** Constr. 1961. CD 8/3/59.

▲ **Mo., Hazelwood**—MOTOR HOTEL—Del E. Webb Corp., 3130 E. Van Buren St., Phoenix, Ariz., 210 unit motor hotel, swimming pool, 4615 Lindbergh Blvd. Over **$2,000,000.** Highway House Chain of Phoenix, Ariz., lessee. Bids Spring 1961.

▲ **Mo., St. Peters**—HOUSING DEVELOPMENT—Hardesty-Johnson Realty Co., Inc., Hy. 140, Florissant, housing development, Rte. No. [illegible] Over **$3,000,000.** Constr. Spring 1961.

▲ **N. H., Salem**—SHOPPING CENTER—D & B Centers Trust, 1815 Mass Ave., Lexington, Mass., plans by John A. Saba & Assoc., 147 Central St., shopping center, Rte. No. 28, **$1,000,000.** CD 6/29, under Debonis Realty Co., as owner.

▲ **N. J., Colonia**—SCHOOL—Diocese of Trenton, Parish St. John Vianney, 47 Glendale Rd. plans by Gerald Phelan, 211 State St., Bridgeport, Conn., school, Inman Ave. **$1,250,000.**

▲ **N. J., Newark**—OFFICE—Office Bldgs. of America Inc., c/o Wiss Co., 673 Broad St., plans by Rotwein & Blake. 1018 Stuyvesant Ave., Union, office renovation. **$1,000,000.**.

N. J., Paterson — SHOPPING CENTER — 430 Madison Ave. Corp., 23 Hamilton St., plans by Harold D. Glucksman, 850 Broad St., Newark, shopping center, Madison Ave. Over **$750,000.**

▲ **N. J., Trenton**—STORE—Philip J. Levin, Rte. 22, North Plainfield, 200,000 sq. ft. store. Spruce St. and Arctic Parkway, Ewin Twp. **$1,000,000.** Korvette's, lessee.

N. Y., Jackson Heights—APARTMENT—Arthur G. Cohen, 1457 Broadway, New York, Zone 36, plans by Paul & Jarmul, 89-51 164 St., Jamaica, N. Y., 6 story apartment, 69 St., 35 Rd., 35 Ave. and Leverich St. **$750,000.**

N. Y., New York—CLASSROOM—Barnard School for Boys, Cayuga Ave. and 246 St., New York, Zone 71, classroom addn., alterations. **$750,000.**

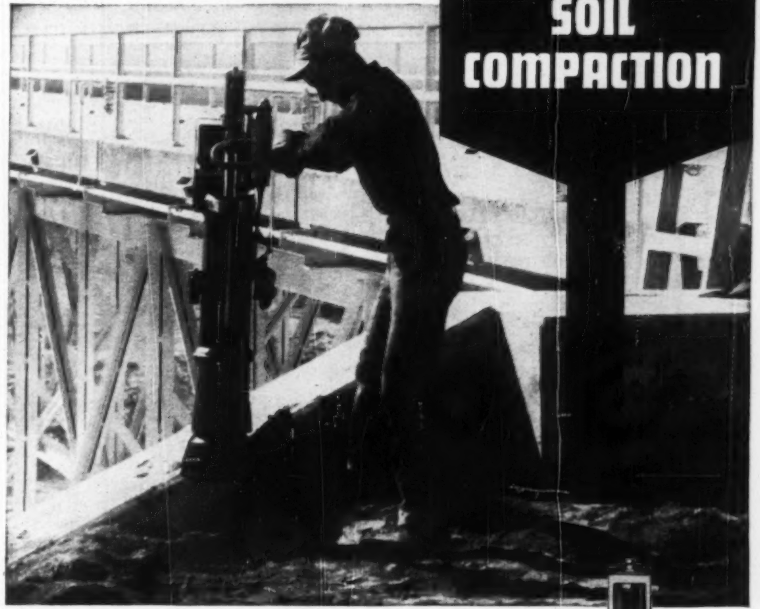
▲ **N. Y., New York**—APARTMENT—Beekman Plaza, Inc., 141 Broadway Zone 6, plans by Robert L.

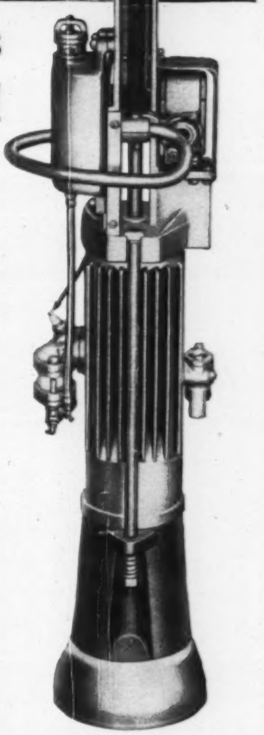
(Continued on page 174)

Where SPECIFICATIONS call for . . . . .

HIGH DEGREE

SOIL COMPACTION





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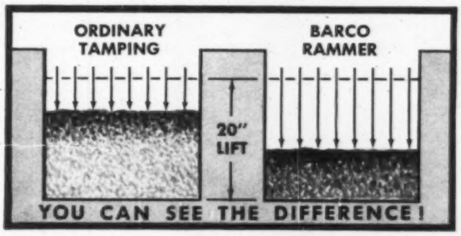

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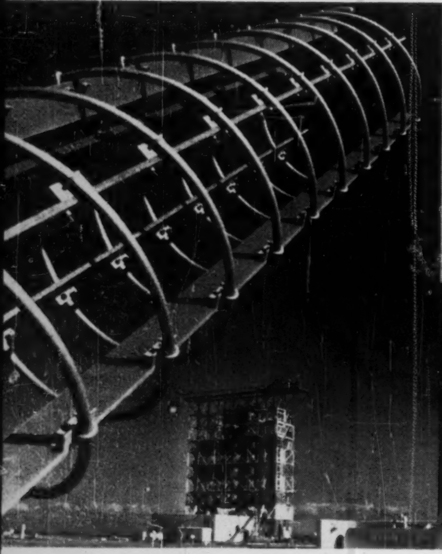
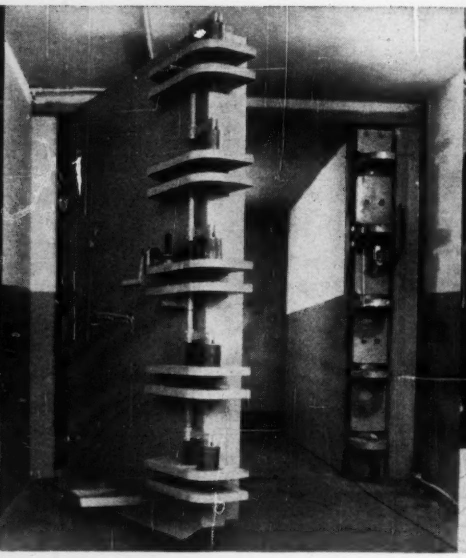
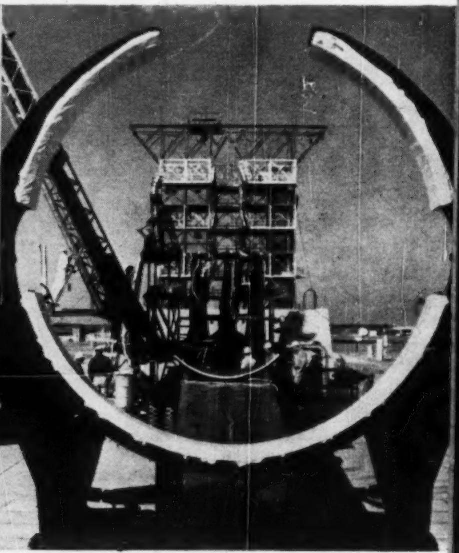


On this vertical oscillating radar tracking unit, every nut, bolt, and insulator collar is Stainless Steel. To the right, is a Stainless Steel fuel tank, and beyond that rises the U. S. Air Force Thor gantry tower, with a structural steel frame similar to a nine-story building.



The door to the U. S. Air Force Atlas blockhouse weighs 24 tons. It is solid manganese steel about eight inches thick. At X minus 15, the door automatically locks and it is blast-proof and vapor-proof.



The mobile transporter for the Thor is strong but light on its wheels because it was designed with weight-saving high-strength steels. Slanting to the left is the steel umbilical tower which carries Stainless Steel fuel lines and control lines.

United States Steel maintains the technical services to provide the proper assistance to cope with any problem on these materials for ground support. When a ground support program is still on the drawing board, consult

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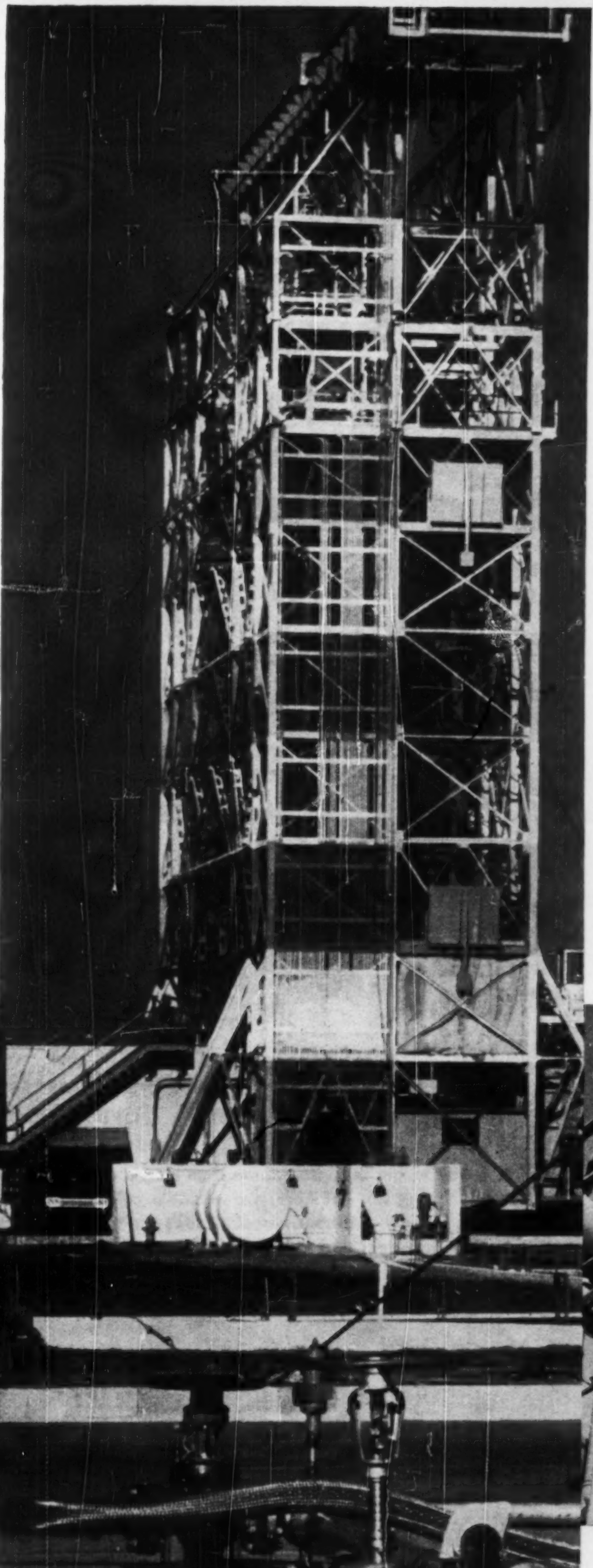

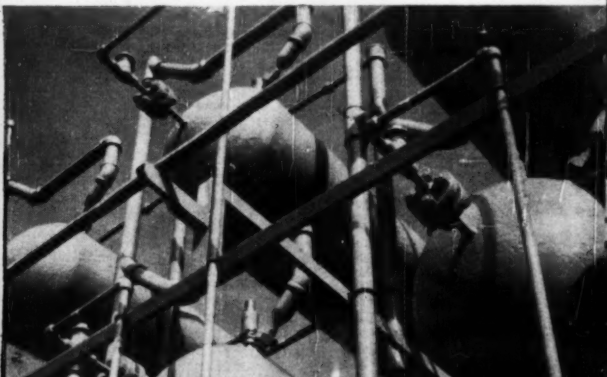

These pressure vessels for the U. S. Air Force Bomarc A system are seamless steel cylinders about 20 inches in diameter and 26½ feet long. The cylinder walls are slightly more than an inch-and-a-half thick and will contain gas at pressure up to 4500 psi.

Stainless Steel pipes and Stainless Steel flexible tubing carry the fuel for the Thor complex. Fuel lines must be almost surgically clean to prevent explosions and assure proper flow. Inspectors check the lines with everything from microscopes to ultraviolet lamps. ▶

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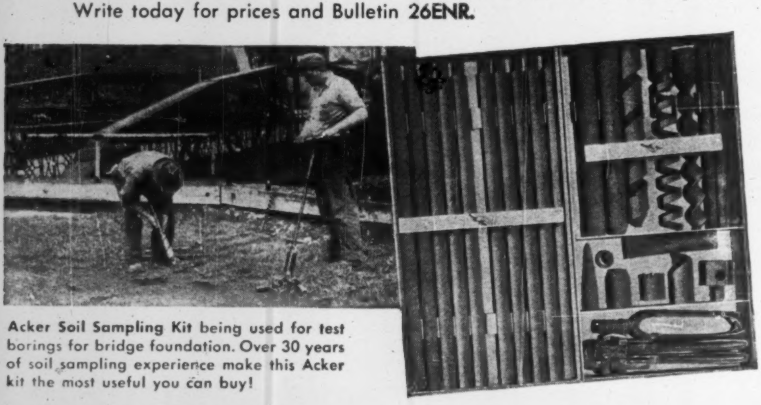

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(Continued from page 171)

Bien, 342 Madison Ave., Zone 17, apartment, 408-24 East 51 St. **$2,000,000.** Kallen & Lemelson, 1860 Broadway, Zone 23, mechanical engrs. James Hufnagel, 103 Park Ave., Zone 17, structural engr. Constr. early 1961. CD 2/25

N. Y., New York—SOCIAL SERVICE CENTER—Grosvenor Neighborhood House, Inc., 743 Amsterdam Ave., Zone 23, plans by Moore & Hutchins, 800 2 Ave., Zone 17, 3 story Social Service Center (Neighborhood House) incl. enclosed roof for playground, Amsterdam Ave. and 105 St. S.E. corner. **$775,000.**

▲ **N. Y., New York**—ANIMAL SHELTER—Humane Society of New York, 313 E. 58 St., animal shelter East 59 St. site. **$1,000,000.** Constr. 1961.

▲ **N. Y., New York**—APARTMENT—The Howing Co., 655 Madison Ave., Zone 21, plans by Robert L. Bien, 342 Madison Ave., Zone 17, 17 story apartment, 333 E. 14 St. **$2,000,000.**

▲ **N. Y., New York**—NURSING SCHOOL—Lenox Hill Hospital, 77 St. and Park Ave., Zone 21, plans by Rogers & Butler, 219 E. 44 St., Zone 17, nursing school, 130 E. 77 St. **$2,000,000.**

▲ **N. Y., St. George**—APARTMENT—London Terrace, Inc., 410 W. 24 St., New York, Zone 11, plans by Philip Birnbaum, 12 E. 48 St., New York, Zone 17, 16 story, 244 unit apartment, Victory Blvd. between Eddy St. and Theresa Pl. **$1,540,000.**

▲ **N. D., Fargo**—NURSING HOME—American Lutheran Homes, Inc., 1026 S. 17th St., plans by Foss & Co., 28 N. 3rd St., Moorhead, Minn., 100 bed nursing home, 1329 3rd Ave. S. **$1,000,000.**

▲ **O., Avon Lake**—HOMES—Lawrence J. Carmon, 32878 Electric Blvd., 70 Homes, Bell Ave., Belle Acres, **$1,200,000.**

▲ **O., Cleveland**—SCIENCE—Catholic Diocese of Cleveland 1027 Superior Ave., Zone 14, science bldg., St. Ignatius High School. **$1,000,000.**

▲ **O., Columbus**—STORE—Sears Roebuck & Co., 970 S. Homan Ave., Chicago, Ill., will not construct 200,000 sq. ft. store, E. Broad St. and Hamilton Rd. **$2,000,000.** Project abandoned. CD 6/20.

▲ **O., Mansfield**—APARTMENTS—Equitable Investments Co., 50 W. Gay St., 270 unit apartment, Trimble-Linden Rd. area. **$2,500,000.**

O., South Euclid—RESIDENCES—Council Gardens, Inc., c/o Joseph S. Silber, Leader Bldg., Cleveland, Zone 14, 60 unit senior citizens residence, **$750,000.**

▲ **O., Wooster**—LIBRARY—College of Wooster, plans by Schafer, Flynn & Williams, 1740 E. 12th St., Cleveland, Zone 14, library. **$1,500,000.** CD 4/16/59.

Tex., Corpus Christi—COMMERCIAL-OFFICE—Ramada Square, 4240 Ocean Drive, will not construct commercial-office, **$750,000** Project abandoned. CD 10/10.

▲ **Tex., Corpus Christi**—HOSPITAL—Dr. Donald Veatch & Assocs., 2466 Morgan St., plans by Easterwood, Easterwood & Drennon, 708 N. Valley Mills Dr., Waco, 98 bed, masonry, concrete hospital, 4500 Blk. Weber Rd. **$1,000,000.**

▲ **Tex., Dallas**—DEPARTMENT STORE—Owner, c/o Jack Wyatt, Life of America Bld., membership department store, **$1,100,000.** Bids soon after 1st of 1961.

▲ **Tex., Houston**—OFFICE—Olson Brothers Constr. Co., 2472 Bolsover St., plans by Flynn & Flynn, 2472 Bolsover St., 7 story, 190,000 sq. ft. A/C office, rein.-con. fdn. **$2,000,000;** 4 story, concrete self-parking garage, **$200,000,** Kirby Drive at Norfolk St. Walter P. Moors, 2 Pinedale St., consult. engr. CD 7/29.

▲ **Tex., Houston**—COMMERCIAL—Percy Smidth Interests, State Natl. Bld., plans by David G. Baer, 1200 Bissonnet St., commercial. **$1,000,000.** CD 7/5.

▲ **Tex., Houston**—APARTMENT, HOTEL—Woodway Glen Developers James A. McBride & Assocs., 3843 N. Braeswood Blvd., plans by Travis Broesche & Assocs., 3271 W. Alabama St., Houston, 8 to 10 story, bsmnt. masonry apartment-hotel, **$2,000,000;** luxury apartment, **$1,000,000;** 1 story masonry shopping center, **$1,000,000.** CD 4/13.

▲ **Tex., Lubbock**—MOTOR-HOTEL—Continental Hotel, c/o Transwestern Developers, Inc., 2908 Slide Rd., plans by Cantrell & Burns, 4005 Ave. Q, Lubbock, 2 story, 70,000 sq. ft. A/C, steel frame, 144 unit, brick, part base, motor-hotel. **$1,000,000.**

▲ **Va., Annandale**—TOWN HOUSES, etc.—Carl M. Freeman, 1111 Fidler Lane, Silver Spring, Md., Americana Fairfax, 3,000 units, town houses, garden type and high rise apartments, Commercial Center, Little River Turnpike. **$30,000,000.** Plan to build 350 units a year. Bids March 1961.

▲ **Wash., Seattle**—APARTMENT—D. Williams & Co., 314 Fairview Ave. N., 11 story, rein.-con. apartment, 415 W. Mercer St. **$1,000,000.** Constr. early next year. .

▲ **Wis., Beloit**—SHOPPING and RECREATIONAL CENTER—Fairbanks-Morse Co., Lawton Ave., 250,000 sq. ft. shopping and recreational center, 2,250 car parking U. S. 51 and Henry Ave. **$8,000,000.** Bids in Spring.

Wis., Milwaukee—BOYS CLUB—Milwaukee Boys Club, 1640 N. Franklin St., boys club. **$750,000.**

Wis., Waukesha—DORMITORY—Carroll College, plans by F. C. Shattuck & M. F. Siewert & Assocs., Inc., 174 E. North Water St., Neenah, men's dormitory. **$800,000.**

B. C., West Vancouver—APARTMENT—British Columbia Teachers Federation, 1815 W. 7th Ave., Vancouver, plans by Koyander & Wright, 1956 W. Broadway, Vancouver, 8 or 10 story, rein.-con. apartment, Bellevue Ave. and 22nd St. **$600,000-$800,000.**

▲ **Ont., Port Hope**—HOSPITAL—Port Hope Hospital Bd., R. H. Baxter, Walton St., plans by Barnett & Reider, 71 Walton St., hospital. **$1,050,000.** CD 7/16/58.

▲ **Ont., Toronto**—APARTMENT—Akiba Investments Ltd., 347 Bay St., 13 story apartment, East Side Rose Ave. **$1,100,000.**

▲ **Ont., Toronto**—APARTMENT—Esfrank Investments Ltd., 347 Bay St., plans by Bregman & Hamann, 146 Bloor St. W., 12 story apartment, southeast corner Howard St. and Ontario St. **$1,300,000.**

▲ **Que., Quebec City**—SHOPPING PLAZA etc.—Les Immeubles Delrano, Inc., 640 St. Jean St., plans by Ian Martin & Victor Prus, 4693 Sherbrooke St. W., Montreal, 2 story, 50,000 sq. ft. shopping plaza and office, Laurier Blvd., St. Foy. **$5,000,000.**

▲ **Que., Sillery** — NOVITIATE, etc. — Les Chanoinesses Hospitalieres de St. Augustin, c/o Hotel Dieu, Charlevois St., Quebec City, plans by Rene Blanchet, 53 d'Auteuil St., Quebec City, novitiate and admin. bldg., St. Louis Rd. **$1,500,000.**

INDUSTRIAL BUILDINGS

▲ **Ill., Chicago**—PLANT, etc.—Zenith Radio Corp., 6001 W. Dickens St., mfg. electronics plant, warehousing, shipping, office, **$3,000,000.**

▲ **N. J., Highstown**—LABORATORY—National Lead Co., 111 Broadway, New York, N. Y., plans by The Ballinger Co., archts.-engrs., 1625 Race St., Phila., Pa., laboratory, East Windsor Twp. **$5,000,000.** CD 6/1/59.

▲ **O., Columbus**—SERVICE—F. & R. Lazarus Co., Town and High Sts., 150,000 sq. ft. service bldg., Harrisonburg Pike, **$1,500,000.** Construction 1962.

▲ **O., Euclid**—ROLLING MILL—General Electric Co., 1 River Rd., Schenectady, N. Y., 125,000 sq. ft. rolling mill, Tungsten Rd. for processing metals for missiles and space vehicles. **$3,500,000.**

▲ **Pa., Ambridge** — MILL — National Supply Co., sub. Armco Steel Corp., Middletown, O., pipe mill.

▲ **Tex., Port Arthur**—PLANT—Texaco, Inc., 401 W. 19th St., benzene plant, **$9,000,000.** CD 5/18/54.

▲ **Tex., Texas City**—PLANT—Amoco Chemicals Corp., Mainland Bldg., resin plant, 8 acres, Hy. 341, **$2,500,000.**

Tex., Tilden—PLANT—Trans-Jeff Chemical Co., 3100 Travis St., chemical production unit. **$850,000.**

▲ **Wis., Superior**—GRAIN ELEVATOR—Donovan Constr. Co., 1725 Carroll Ave., St. Paul, Minn., grain elevator, **$5,000,000.**

▲ **Ont., Smith Falls**—FACTORY—H. B. Reese Candy Co., Rte. 422 W, Hershey, Pa., U.S.A., factory with underground pipe line to Hershey factory. **$1,000,000.**

▲ **Ont., Toronto**—BREWERY, etc.—O'Keefe Brewing Co., Ltd., 285 Victoria St., 4 story, 328,000 sq. ft. brewery, 2 story office, bottling and shipping bldg., power house and maintenance shop. **$10,000,000.** Bids in Spring 1962.

▲ **Ont., Toronto**—PARKING DECK—Promenade Swiss Corp. Ltd., 670 Bayview Ave., plans by K. R. Cooper, 59 Mobile Dr., steel, concrete parking deck, Yonge St. **$1,500,000.**

▲ **Que., New Richmond**—MILL—Bathurst Power & Paper Co., Ltd., 635 Dorchester Blvd. W., Montreal, Kraft Paper Mill, **$5,000,000.**

PUERTO RICO

▲ **Puerto Rico, Guaynabo** — APARTMENTS — Nueva Caparra Investment Corp., Box 8795, Santurce plans by Gonzalez & Gonzalez, P. O. Box 8795, Santurce, Puerto Rico, 180 apartment project, rein.-con. six separate bldgs.; 60 apartments, 1st Stage. **$2,500,000.**

AMERICANS ABROAD

▲ **Australia, St. Mary's**—PLANT—Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul, Minn., U.S.A., 40,000 sq. ft. plant to mfg. coated abrasives at site of existing plant **$1,000,000.** "3M Australia", subsidiary of Minnesota Mining & Mfg. Co.; St. Paul, Minn., U.S.A., will supervise.

FOREIGN

▲ **India, Bayyaram**—STEEL MILL—Govt. of Andhra Pradesh, steel mill with daily output of 100 tons, near Kolhagudem. **$14,700,000.**

▲ **India, Hyderabad**—SHEET GLASS PLANT—Govt. of Andhra Pradesh, sheet glass plant. **$2,100,000.**

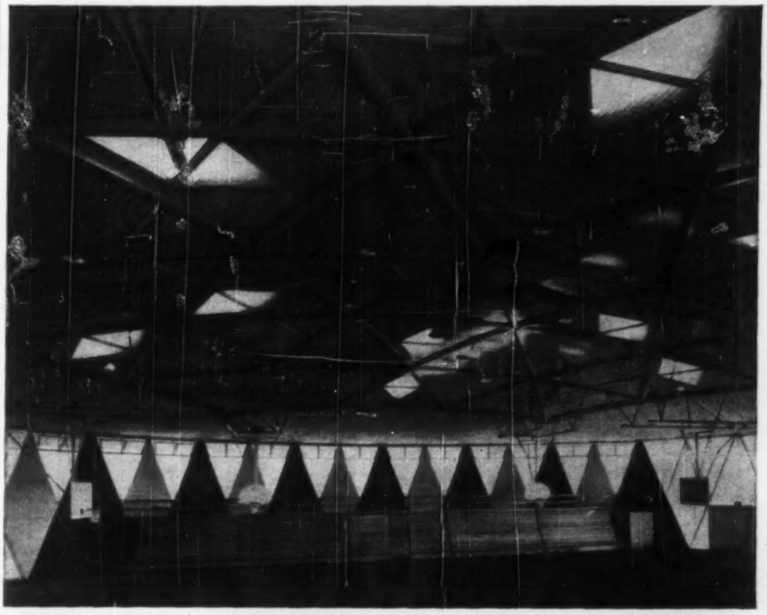
▲ **India, Hyderabad**—STEEL RE-ROLLING MILL—Govt. of Andhra Pradesh, steel re-rolling mill. **$2,100,000.**

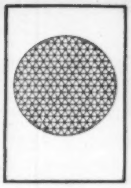
▲ **Norway**—Norwegian Watercourse and Electricity Bd., Kingdom of Norway, Oslo, Tokke hydroelectric development, incl. 3 power plants, 810,000 kw. capacity and transmission lines connecting networks serving southern- and western Norway. **$58,000,000.** (World Bank Loan-$25,000,000). CD 5/10/56.

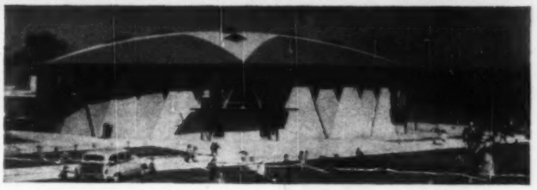
▲ **Vietnam, Thu-Duc**—National Office for Reequipment of Installatons for Production and Distribution of Electric Power, Govt. of Vietnam, 33,000 kw thermal power plant, transmission and distributon facilities to provide power to the Saigon-Cholon area, Saigon River. **$12,700,000** (DLF loan).

Gymnasium of Mountlake Terrace High School, near Seattle, Washington. Architect: Ralph H. Burkhard, Seattle; contractor: Brazier Construction Company, Seattle.

Space provided: full size basketball court with seating for 2500 spectators. *Roof framing:* 125-foot Triax dome by Timber Structures, Inc., with dome segments of glulam timber. *Exterior walls:* tilt-up concrete panels with exposed crushed marble aggregate; glass panels set in aluminum frames. *Interior walls:* painted concrete and glass. *Heating:* peripheral hot air circulating system with ducts below floor level. *Ventilation:* mechanical and natural systems. *Lighting:* mercury vapor fixtures; Everlite skylights. *Floor:* maple over criss cross spring system. *Roof surface:* 20-year bonded glass type over heavy timber decking; ceiling of sprayed asbestos fibre. *Area:* 12,272 square feet. *Volume:* 307,000 cubic feet. *Cost:* $11.50 a square foot including architect's fee and sales tax.







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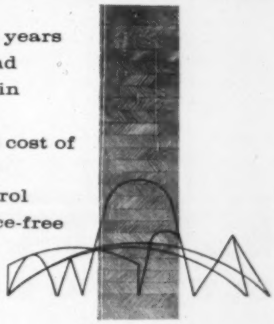

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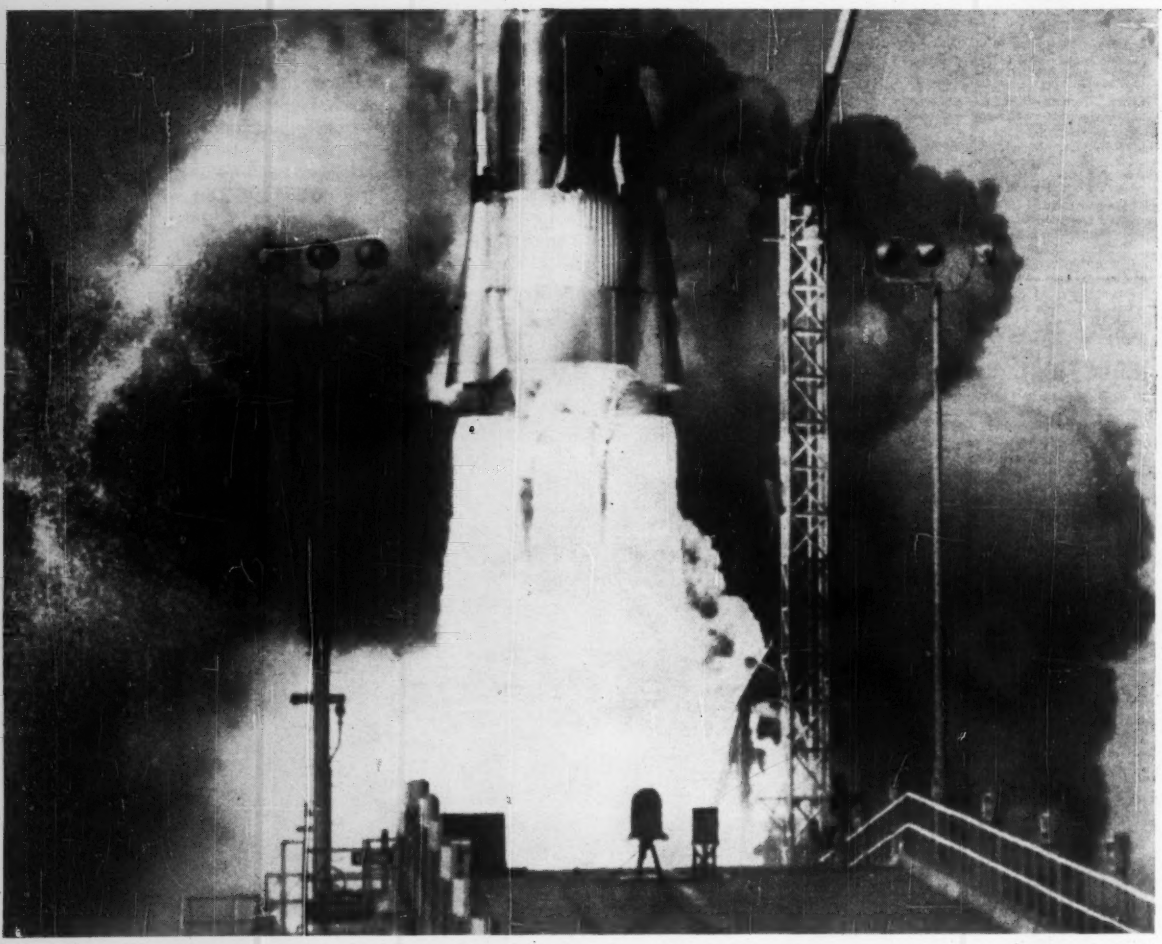

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

December 28 Maine — January 3 Connecticut

BUILDINGS—LB & CA

▲ **Empire Builders, Inc.**, Fernbell Lane, West Hartford, Conn., Owner Builds, **$2,100,000**, 150 HOUSES, Addison St., BLOOMFIELD, CONN. CD 8/27/56.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

January 10 Maryland

STREETS AND ROADS

December 29 Pennsylvania — January 10 Maryland

▲ **Pa., Lebanon**—BA 1/18—City Authority, City Hall, sewage treatment plant, $2,600,000. Plans deposit $65. Gannett, Fleming, Corddry & Carpenter, Inc., 600 N. 2nd St., Harrisburg, engrs. CD 11/21/57.

BUILDINGS—BA

▲ **N. Y., Midland Beach**—SCHOOL—BA 12/28—Deputy Supt. Schools, Bureau Constr., 42-15 Crescent St., 4 Floor, Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures Junior High School 2, Midland Bedford and Roundary Aves., Richmond Boro. $3,300,000. Extended date. Plans deposit $35. general, $15 mechanical trades. CD 11/21.

▲ **D. C., Wash.**—SCHOOL—BA 1/19—Dpt. Bldgs. & Grounds, D. C. Govt., 499 Pennsylvania Ave. N. W., Bertie Backus Jr. High, South Dakota Ave. and Hamilton St. N. E. $2,000,000. Plans deposit $125. Mills, Petticord & Mills, 3308 14th St. N. W., Wash., D. C. archts. CD 9/8/59.

▲ **N. J., Elizabeth**—HOSPITAL ADDN.—BA 3/15—St. Elizabeth's Hospital, 204 S. Broad St., 5 story hospital addn., S. Broad St. $5,363,000 Eggers & Higgins, 787 United National Plaza, New York, N. Y., archts. CD 9/16.

HEAVY CONSTRUCTION—LB & CA

NEW YORK—State Hy. Dpt., State Office Bldg., Albany,

A. E. Ottaviano, Inc., 80 Brook St., Croton-on-Hudson, N. Y., CA **$5,557,804**, est. $7,491,000 railroad relocation 3.14 mi. 2.85 mi. cem. conc. pavt. 5 HG seps. and 2 RR plate girder bridges New York City Erie and Niagara Falls and town of Niagara PSC 6607, Niagara Co. Bids Oct. 20, awarded Dec. 2. CD 10/21, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,

N. Y.—**D. W. Winkelman Co., Inc.**, 300 Long Branch Rd., Syracuse 9, N. Y., CA **$8,072,592**, est. $10,145,000 b. conc. 4.37 mi., 6.54 mi. acc. 3 H.G.S. comp I-beam 4 spans, 222.55 ft, 4 spans, 227.0 ft. total, 3 spans, 159.91 ft. total, 1 bridge comp. I-beam 2 spans, 124.56 total, 2 RRGS comp. I-beam 1 span. 96.75 ft., 3 spans 246.84 ft. total, viaduct comp. I-beam 19 sp. 1250.5 ft. total, City of Utica-North South Art. Hy. (South City line to Oriskany St. West) Seneca Turnpike-Utica Co., city Line Rte. 5 & 12, FAC 60-25, FASH 60-12 Proj. U-UG 752 (8), U-752 (8), Oneida Co.;

N. Y.—**Mayer Bros. Constr. Co.**, 1227 W. 18 St., Erie, Pa., CA **$588,596**, est. $764,000, b. conc. 4.22 mi. misc. work 0.4 mi. Salamanca-Little Valley, Pt. 2, SH 8149; Little Valley-Randolph, Pts. 1&2, SH 8149, Rte. 242 R.C. 60-179, Cattaraugus Co. Bids Nov. 17, awarded Dec. 2. CD 11/18, under LB.

▲ **NEW YORK**—State Hy. Dpt., State Office Bldg., Albany,

N. Y.—**Stimm Assoc., Inc.**, 685 Ellicott Sq., Buffalo 3, N. Y., CA **$982,550**, est. $1,525,000, b. conc. 0.39 mi., multiple span comp. beam 825 ft. total Louisiana St. Viaduct over New York City and Erie RR, Int. Rte. 506, New York State Thruway-Niagara Section (Louisiana St. Viaduct) FINTC 60-2 PSC 15216 Proj. I-190-1(23), Erie Co.;

N. Y.—**Wm. E. Bouley Co., Inc.**, 265 Genesee St., Auburn, N. Y., CA **$1,152,122**, est. $1,518,000, b. conc. 5.34 mi. incl. 7x16 ft. twin conc. box, 9x20 ft. twin conc. box Skaneateles-Lafayette Pt. 2 SH 8360, Marietta-Marcellus, SH 971, Skaneateles-Marcellus, Rte. 174 & 20N, FARC 60-165 FASS 6-15, Onondaga Co.;

N. Y.—**Bero Constr. Corp.**, Box 70, W. River Rd., Waterloo, N. Y., CA **$1,947,751**, est. $2,289,000 8 in. cemn. conc. pavt. 7.91 mi. Old Forge-McKeever, SH 426, Rte. 28. R.C. 60-170, Herkimer Co. Bids Oct. 20, Grand total $4,082,423. CD 10/21, under LB.

▲ **MARYLAND**—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3,

Wright Contg. Co., Brookhaven Rd., Columbus, Ga., CA **$1,182,861**, grading, surf. and storm sewer 2.484 mi. Md. 93, Wheaton to Four Corners, M-517-4-320, Montgomery Co. Bids Oct. 25. CD 11/3, under LB.

BUILDINGS—LB & CA

▲ **Wilmorite, Inc.**, Box 370, Rochester 2, N. Y., CA Est. **$3,250,000**, six 2½ story, 210 unit APARTMENTS, BRIGHTON (STA. ROCHESTER), N. Y. Landing Heights Apartments, Inc., Brownwood Blvd., Brighton, N. Y. Faragher & Macomber, 900 Powers Bldg., Rochester, N. Y., archts. CD 4/9/59.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 1, N. Y., LB **$2,330,000**, (5 bidders), general contract JUNIOR HIGH SCHOOL 192, Hollis and 111 Aves., 204 and 205 Sts., Queens Boro, HOLLIS, N. Y. Deputy Supt. Schools, Bureau Constr., 42-15 Crescent St., 4 Floor, Long Island City 1, N. Y. Bids Dec. 13. CD 11/15.

▲ **Taylor Mt. Prospect Corp.**, 420 Lexington Ave., New York, N. Y., Owner Builds, **$2,000,000**, Unit 2, 14 story, 113 unit APARTMENT, 402 Mt. Prospect Ave., NEWARK, N. J. Isadore Naftali, 312 High St., Newark, N. J., archt.

▲ **Roland S. Catarinella**, 901 Elizabeth, Monroeville, Pa., CA Est. **$20,000,000**, East Hills HOUSING DEVELOPMENT, incl. residences, 2 story town houses and apartments, Robinson Blvd. and Frankstown Rd., WILKINSBURG, PA. Action Housing, Inc., 1 Gateway Center, Pittsburgh 22, Pa. B. Kenneth Johnstone, 424 4th Ave., Pittsburgh, Pa., and Satterlee & Smith, 3 Dupont Circle, N.W., Wash., D. C., archts. Simonds & Simonds, 119 E. Montgomery, Pittsburgh, Pa., engrs.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Louisiana**—BA 1/10—U. S. Eng., foot of Prytania St., New Orleans, removal and disposal by hydraulic dredge 8,491,000 cu. yd. material Mississippi River-Gulf Outlet from Sta. 1809 plus 80 to Sta. 2049 plus 40, St. Bernard Parish, CIVENG-16-047-61-88. $2,000,000. CD 9/20.

▲ **Fla., Boynton Beach**—BA 1/18—City, City Hall, (A) water treatment plant (B) distribution lines (C) 500,000 gal. elevated tank (D) deep wells, $1,500,000. Plans deposit $100. Russell & Axon, Municipal Airport, Daytona Beach, engrs. CD 10/20/59.

HEAVY CONSTRUCTION—LB & CA

▲ **NORTH CAROLINA**—State Hy. Comn., Capitol Bldg., Raleigh,

N. C.—**Ballenger Paving Co.**, Paris Station, Greenville, S. C., and **Propst Constr. Co.**, Concord, N. C., CA **$977,543**, concrete pavement, Interstate Rte. 40, Statesville By-Pass, Proj. 8.16415, Iredell Co.; CA **$1,747,654**, concrete pavement relocation of US Rte. 1, Proj. 8.14775, Wake Co.;

N. C.—**Southern Roadbuilders, Inc.**, 2312 Ada Ramp, Walden Rd., Augusta, Ga., CA **$1,587,418**, concrete pavement, Interstate Rte. 85 between Gastonia and Catawba River, Proj. 8.16318, Gaston Co. Bids Nov. 22, awarded Dec. 13. Grand total $4,312,615. CD 11/30, under LB.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee, Bids opened 12/8,

Powell Bros., Inc.. Box 281, Fort Lauderdale, Fla., LB **$1,474,495**, four-lane limerock base, type 1 b. conc. surf. with binder course, Type 1-B surf. treat, 189 ft. four lane bridge of prestressed conc. slab units on prestressed conc. pile bents, aluminum handrail, guardrail, 354 ft. bridge with electrically-operated double-leaf bascule span, conc. piers founded on steel piling, two flanking spans of conc. slab deck, steel I-Beams, two approach spans of conc. slab deck and prestressed conc. beams on prestressed conc. pile bents having conc. and aluminum pipe handrail, bridge roadway and navigation lighting, treated timber fender system, conc. sheet pile bulkheads, approx. 1,731 mi., State Proj. Job No. 86600-3175, SR S-822, Sheridan Drive in Hollywood from SR 5 to SR A-1A, Broward Co. CD 11/17.

▲ **FLORIDA**—State Road Dpt., Tallahassee, Bids opened 12/8,

Fla.—**Wright Contr. Co.**, Box 1580, Columbus, Ga., LB **$1,869,261**, (7 bidders), grading, 8-lane divided plain c. conc. pavement, storm sewers, 3 dual grade separation bridges, conc. deck, prestressed conc. beams on conc. piers founded on prestressed conc. piling, aluminum handrail, roadway lighting, fencing, approx. 1.521 mi., Federal Aid Interstate Proj. No. I-95-1 (27)8 Job No. (87270-3411) SR 90A, between N. W. 95th St., and N. W. 119th St., Dade Co.;

Fla.—**Al J. Capeletti, Inc.** Box 1147, Hialeah, Fla., LB **$1,973,859**, (8 bidders), grading, 6-8 lane divided 9 in. plain c. conc. pavement, constructing 3 dual grade separation bridges, conc. deck, prestressed conc. beams supported on conc. piers founded on prestressed conc. piling, aluminum handrail, rearway lighting, fencing, approx. 1.018 mi., Federal Aid Interstate Proj. No. I-95-1(29)10 (Job No. 87270-3414), SR 9A, between 119th St. and 135th St. in North Miami, CD 11/23.

▲ **KENTUCKY**—Commonwealth of Kentucky, Dpt. Hys., Frankfort,

Ky.—**Kelly Contr. Co.**, 317 Wallace Ave., St. Matthews, Ky., CA **$1,699,333**, c. conc. pavt. 6.253 mi. Louisville-Lexington. I-64-3(4)31, Shelby Co.;

Ky.—**R. B. Tyler Co.**, 1446 Levering St., Louisville, Ky., CA **$1,134,864**, c. conc. pavt. 4.32 mi. Louisville-Lexington: I-64-3(10)42, Shelby and Franklin Counties. Bids Dec. 2, awarded Dec. 8. CD 12/6, under LB.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Bids opened 12/9,

Tenn.—**John L. Brinkley**, Shelbyville, Tenn., LB **$1,127,707** (20 bidders), grading, constr. 5 bridges, on sect. of Interstate Rte. No. 40, 5.663 mi., Proj. No. I-40-3(23)170, Dickson Co.;

Tenn.—**L & A Contracting Co.**, Hy. 49, N. Bypass, Box 1651, Hattiesburg, Miss., LB **$1,156,256** (10 bid-

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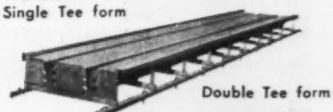

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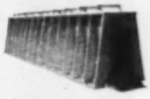

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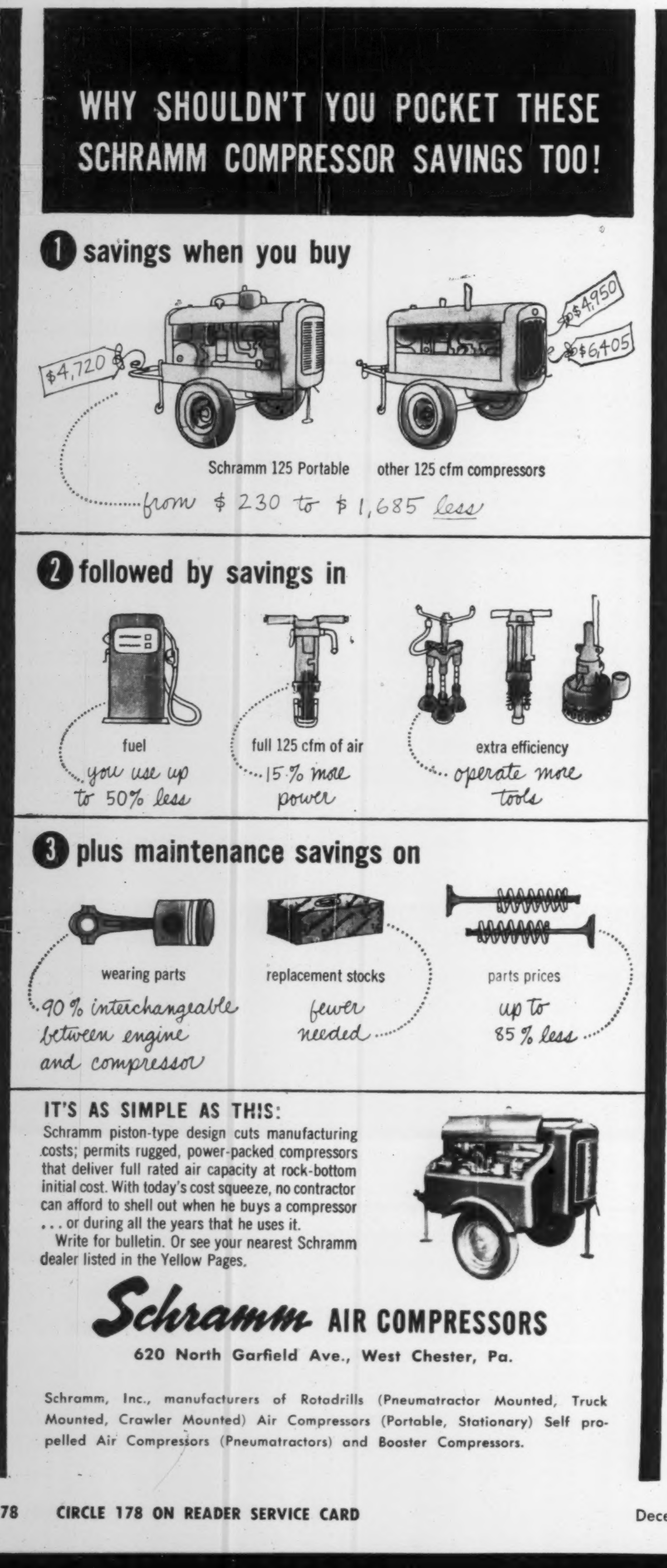

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ders), grading, constr. ten bridges, on sect. Interstate Rte. 40, 8.857 mi., Proj. No. I-40-1(24)41, Fayette and Haywood Counties;

Tenn.—**Oman Constr. Co.**, Acklen Park, Nashville, Tenn., LB **$2,649,889** (5 bidders), grading, paving interstate routes with cement con. and cross roads and frontage roads with bit. materials and constr. 4 bridges, on section of Interstate Rte. 24, 2.208 mi., Proj. No. I-24-3(15)128, Hamilton Co.;

Tenn.—**Mid-South Pavers**, 720 Argyle Ave., Nashville, Tenn., LB **$700,283** (11 bidders), constr. crushed stone and penetration macadam base and paving with bit. materials, 4.314 mi., Proj. No. I-40-7(21)372, Knox Co.;

Tenn.—**Tennessee Asphalt Co.**, Candow Ave., Knoxville, Tenn., LB **$897,099** (10 bidders), constr. crushed stone and penetration macadam base and paving with bit. materials, 4.642 mi. Proj. No. I-40-7(22)377, Knox Co.;

Tenn.—**A. B. Long, Inc.**, Harriman, Tenn., LB **$1,599,823** (8 bidders), grading, constr. four bridges, 0.613 mi. Proj No. I-75-3(9)87; grading and constr. 1 bridge, 1.258 mi., Proj. No. I-640-7(18)388, Knox Co.;

Tenn.—**Clinchfield Concrete & Constr. Co.**, Wexler St., Kingsport, Tenn., LB **$1,396,629** (8 bidders), constr. soil cement base and paving with cement concrete, 7.387 mi. Proj. I-40-1(27)79, Madison Co.;

Tenn.—**J. W. Owen, Inc.**, 1587 Chelsea Ave., Memphis, Tenn., LB **$905,392**, paving with cement concrete sect. of southeast circumferential around Memphis, 2.821 mi. Proj. No. I-240-1(28)18, Shelby Co.;

Tenn.—**Weymouth Constr. Co.**, 2174 E. Person Ave., Memphis, Tenn., LB **$1,038,814** (5 bidders), paving with cement sect. of southeast circumferential around Memphis, 2.234 mi. Proj. No. I-240-1(29)25, Shelby Co.;

Tenn.—**John L. Brinkley**, Shelbyville, Tenn., LB **$806,020**, (12 bidders), grading, constr. 4 bridges, 3.06 mi. Proj. No. I-65-2(5)62; grading, paving with crushed stone and bit. materials State Rte. 96, 0.587 mi. Proj. No. F-070-2(2), Williamson Co. CD 11/21.

BUILDINGS—LB & CA

▲ **Cal Kovens Constr. Corp.**, 1770 Bay Rd., Miami Beach Fla., CA Est **$1,500,000**, 101,000 sq. ft. MOTOR HOTEL, swimming pool, 10 cabanas, paving, TAMPA, FLA. The Causeway Inn., c/o Theodore R. Kipnis, 940 Lincoln Rd., Miami Beach, Fla. Morris Lapidus, Kornblath, Harle & Liebman, 940 Lincoln Rd., Miami Beach, Fla., archts.

▲ **Humble Oil & Refining Co.**, Esso Standard Div., North Baton Rouge, La., Owner Builds, **$1,750,000**, 1400 bbl. LUBE OIL PLANT enlargement, BATON ROUGE, LA. CD 2/1/46.

▲† **Nuclear Development Corp. of America**, 5 New St., White Plains, N. Y., CA Est. **$1,400,000**, FAST BURST REACTOR, incl. core of uranium molybdenum alloy, without shielding, 2 mi. from OAK RIDGE, TENN. Atomic Energy Comn., Oak Ridge, Tenn. Giffels & Vallet, Inc., Marquette Bldg., Detroit, Mich., and Oak Ridge Laboratory, operated by United Carbide Corp., Oak Ridge, Tenn., engrs. CD 9/12/58.

MIDDLE WEST

BUILDINGS—BA

▲ **Ill., Chicago** — APARTMENTS — BA 1/6 — Bee-Gee Builders, 5927 W. Addison St., 20 story, 250 x 263 ft., apartments, Sheridan Rd. and Devon Ave. $10,000,000. Guy C. Parker, 2772 Skokie Valley Hy., Highland Park, archts. CD 7/16/59.

▲ **Wis., Oshkosh**—LIBRARY—BA 1/18—Wisconsin State Agencies, Bldg. Corp., 743 State Office Bldg., Madison, Zone 2, library, Wisconsin State College, $1,500,000. Plans deposit $50. Ireion & Reinke, 805 Main St., archts. R. D. Culbertson, state engr. CD 10/7/59.

BUILDINGS—SLC

▲ **Ill., Chicago** — HOSPITAL — St. Bernards Hospital, 6337 Harvard Ave., soon lets contract 100 bed hospital addn. $2,000,000. Fugard Burt Wilkinson & Orth, 520 N. Michigan Ave., Zone 11, archts. CD 10/7/53.

HEAVY CONSTRUCTION—LB & CA

OHIO—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15,

O.—**Shelly & Sands, Inc.**, Thornville, O., CA **$1,171,927**, est. $1,475,000, Type T 35 on B 20 6.203 mi. Newton and Harrison Twps. State Rte. 75, Sections 0.00, 26.57, Muskingum and Perry Counties, Proj. 763;

O.—**The Penker Constr. Co.**, 1030 Summer St., Cincinnati, O., CA **$4,675,964**, est. $5,652,000, Type T 71 and structures 1.67 mi. US Rte. 25, Section 0.46, US R 50, Section 20.43, I 75-1(42)00, I 71-1(18)00, U-1100(8) City of Cincinnati, Proj. 764, Hamilton Co.

▲ **INDIANA**—State Hy. Comn., State House Annex, Indianapolis,

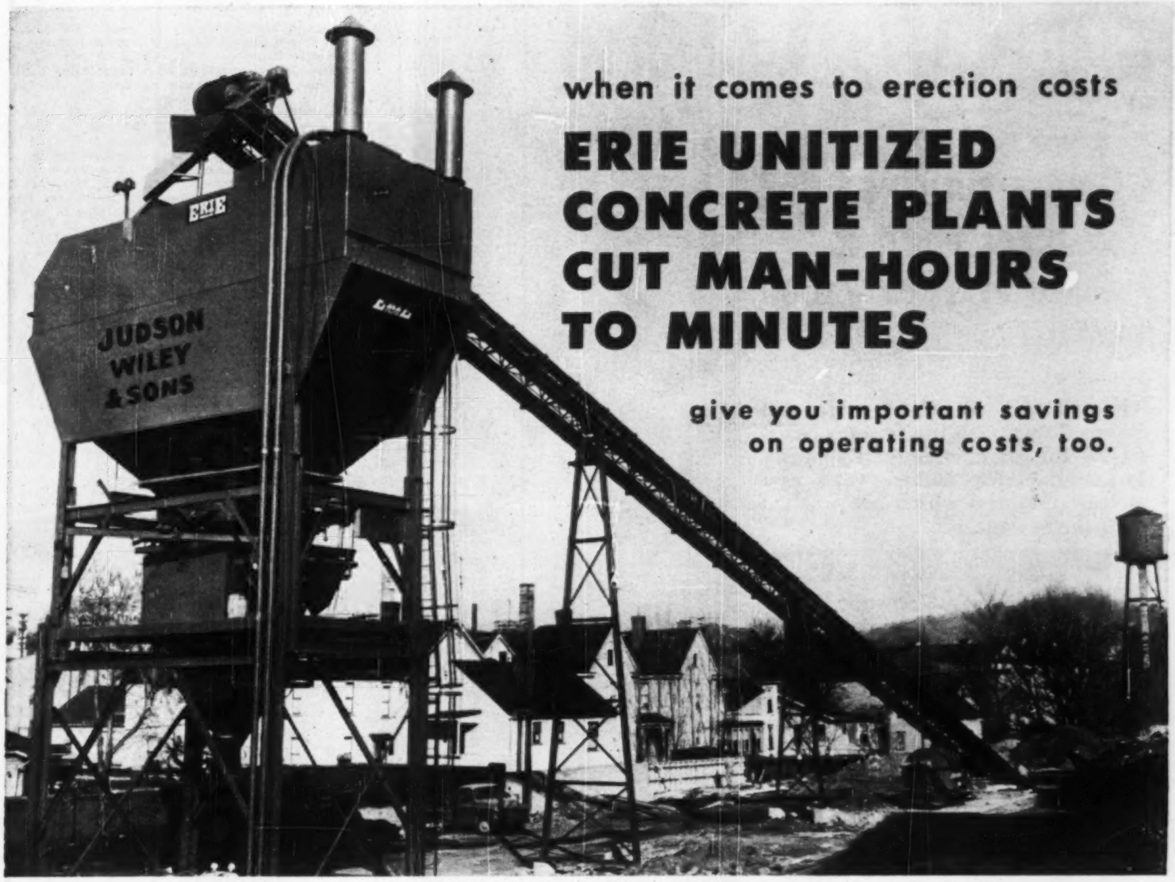
Ind.—**Vogel Constr. Co.**, 3760 East St. Clair, Indianapolis, Ind., CA **$1,309,848**, rein.-con. pavement, Contract R 5177, Madison Co.;

Ind.—**Phend & Brown & Gast Constr.**, 216 S. Columbia St., Warsaw, Ind., CA **$754,402**, rein.-con. pavement, Contract R 5180, Wabash Co. Bids Dec. 6. CD 12/9, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing 26, Bids opened 12/7,

Mich.—**S. D. Solomon & Sons**, 3760 Elizabeth Lake Rd., Pontiac, Mich., LB **$3,573,564**, 4.8 mi. freeway from Walton Blvd. northwesterly to Baldwin Rd. incl. 6 structures; LB **$4,012,804**, 7.4 mi. freeway and 2 structures from Baldwin Rd. northwesterly to Allen Rd., both in Oakland Co.;

(Continued on page 180)



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(Continued from page 178)

Mich.—**L. A. Davidson**, 213 E. St. Joseph, Lansing, Mich., LB **$1,528,187**, 2.7 mi. freeway and 3 structures from Fenton-Clio Freeway south of Flint easterly to Fenton Rd., Genesee Co.; LB **$2,284,656**, 5.7 mi. freeway and 3 structures from Chilson Rd. easterly to near Challis Rd. north of Brighton, Livingston Co., CD 11/28;

Mich.—**Holloway Constr. Co.**, 29350 Joy Rd., Livonia, Mich., LB **$2,829,659**, 4.7 mi. US 16 freeway (Interstate 96) from M-110 eastern end of 40 mi. stretch of freeway now in use between Lansing and Grand Rapids southeasterly to Eaton-Clinton county line incl. grade separation to carry Wacousta Rd. over freeway 8 mi. northwest of Lansing and interchange at existing US 16 7 mi. northwest of Lansing, Clinton Co., CD 11/10;

Mich.—**Canonie Constr. Co.**, South Haven, Mich., LB **$1,884,605**, 2.6 mi. freeway and four structures from north county line south to M-43 west of Lansing, Eaton Co., CD 11/28; LB **$922,092**, about 1 mi. of roadway and 2 structures from Huron River Dr. north to Geddes Rd., US-23, Washtenaw Co.;

Mich.—**W. H. Knapp**, Box 593, Monroe, Mich., LB **$2,239,016**, 3.6 mi. freeway and 3 structures from Stark Rd. west to west bank of Sanford Lake, Midland Co.;

Mich.—**Pierson Cont. Co.**, 200 Eddy Bldg., Saginaw, Mich., LB **$3,952,575**, 7 mi. freeway and 5 structures from Sanford Lakewest to M-18, Midland Co.;

Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich., LB **$1,714,545**, 3.1 mi. freeway and 4 structures from Herrick Rd. just south of Clare in Isabella Co. north to Colonville Rd., 2 mi. north of Clare, Clare Co., CD 11/18;

Mich.—**Holloway Constr. Co.**, Livonia, Mich., LB **$2,456,140**, 5.8 mi. US 27 freeway and one structure from Colonville Rd. north to Hatton Rd., Clare Co.;

Mich.—**Johnson-Greene Co.**, 416 E. Huron St., Ann Arbor, Mich., LB **$1,743,046**, 5.3 mi. US 27 freeway and 3 structures from Charles Brink Rd. north to Gaylord, Otsego Co.; LB **$2,943,787**, 8.7 mi. US 27 freeway Interstate 75 and 5 structures from M-32 at Gaylord north to Vanderbilt, Otsego Co.;

Mich.—**Alpine Constr. Co.**, 245 Marquette, St. Ignace, Mich., LB **$1,233,498**, six tenths of mi. Interstate 75 from Easterday Ave. north to Eureka St. leading to approaches to International Bridge at Sault Ste. Marie, Chippewa Co., CD 11/18;

Mich.—**Darin Armstrong, Inc.**, 2041 Fenkell, Detroit, Mich., LB **$1,666,545**, 1 mi. preliminary work for extension of John C. Lodge Freeway from Wyoming Ave. (Northern end of Lodge) to Meyers Rd., Wayne Co. CD 11/10.

Mich.—**L. W. Edison**, 3134 Midland Dr. S.E., Grand Rapids, Mich., LB **$3,322,630**, 8.3 mi. US 23 freeway and 3 structures from US 16 at Brighton north to tie into completed four-lane hy. now in use north of M-59, Livingston Co.

BUILDINGS—LB & CA

- ▲ **Franam Development & Constr., Inc.**, 3451 Valeston Parkway, Toledo, O., Owner Builds, **$3,500,000**, 150 HOMES, Ottawa Hillside, Secor Rd. between Dorr and Bancroft Sts., TOLEDO, O.
- ▲ **Paschen Contractors, Inc.**, 2739 N. Elston St., Chicago, Ill., LB **$3,135,000** (6 bidders), CHA Proj. Ill. 2-30, Stage II, two 16 story William Greene HOUSES, W. Scott St., N. Ogden Ave., N. Clybourn Ave. and N. Larrabee St., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, Ill. Bids Dec. 15. CD 11/29.
- ▲ **Virginia Engineering Co.**, 80 29 St., Box 971, Newport News, Va., CA Est. **$5,000,000**, MFG. WAREHOUSE and OFFICE expansion, DECATUR, ILL. Mueller Co., 512 Cerro Gordo St., Decatur, Ill. Bids Oct. 25. CD 10/21.
- ▲ **E. H. Marhoefer, Jr., Co.**, 2424 N. 25 Ave., Franklin Park, Ill., CA **$1,750,000**, 7-story, 194 x 100 ft., 26 units, air-conditioned, precast concrete APARTMENTS, 1410 Sheridan Rd., WILMETTE, ILL. 1410 Sheridan Wilmette Corp., 33 S. Clark St., Chicago 3, Ill. Awarded about Dec. 1. CD 6/24.
- ▲ **Hutter Constr. Co.**, 134 Western Ave., Fond du Lac, Wis., CA **$1,358,760**, CORRECTIONAL INSTITUTION, Kettle Moraine, PLYMOUTH, WIS. State Dpt. Pub. Welfare, Madison, Wis. CD 10/14, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

- ▲ **Tex., Dallas**—BA 2/6—Dpt. P. Wks., City Hall, 36 m.g. daily capacity sewage treatment plant, $2,230,000. Plans deposit $50. CD 12/5/58.
- ▲ **Colo., Colorado Springs**—STADIUM—BA 3/1—Air Force Academy Foundation, First National Bank Bldg. (selected list of bidders), rein.-con. stadium, Air Force Academy. $2,000,000. Praeger, Kavanagh, Waterbury, 126 E. 38th St., New York, N. Y., archts. and engrs. Gordon Sweet, 222 E. Bijou St., assoc. archt. Joseph F. Jelley, 131 E. Vermijo Ave., engr. CD 11/29.

BUILDINGS—BA

- ▲ **Colo., Denver**—SCIENCE, etc.—BA 1/5—University of Denver, University Park Campus, 63,300 sq. ft. science, engineering and research center at University Park Campus (Boettcher Center for Science). $5,000,000. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts. Fuller, Fuller & Fuller, 831 14 St., assoc. archts. CD 9/16/59.
- ▲ **Minn., Bloomington (P. O. Minneapolis)**—STADIUM ADDN.—BA 1/31—Metropolitan Sports Area Comn, 7800 Cedar Ave., Metropolitan stadium addn. at

(Continued on page 184)

2½-yard P&H shovel digs
rock on uneven footing . . .

OUR MAGNETORQUE-EQUIPPED P&H

"takes a 3½-ton bite every 15 seconds"

. . . FLOYD L. SOMERS CO., Medford, Oregon

makes fast swing
and dumps load
into truck.

Harlan E. Weaver, Superintendent, reports . . . "*Moving rock like this is hard work, and our 2½-yard* P&H *crawler shovel has been doing it for the past 4 years. This machine has Magnetorque swing, which is the big reason we get a complete work cycle in 15 seconds . . . 40% faster than the shovel we used to use. This really adds up to top yardage at the end of the day.*"

Smoother, faster swings speed up operation. Floyd L. Somers has the contract to excavate, haul and supply the fill for the new bridge over the Siuslaw River near Florence, Oregon. Of prime importance to him is the speed with which he can excavate rock and load trucks for the haul to the dumping site. That's why Magnetorque is so important on his 2½-yard P&H shovel. It gives him faster, smoother swings with an average work cycle time of 15 seconds.

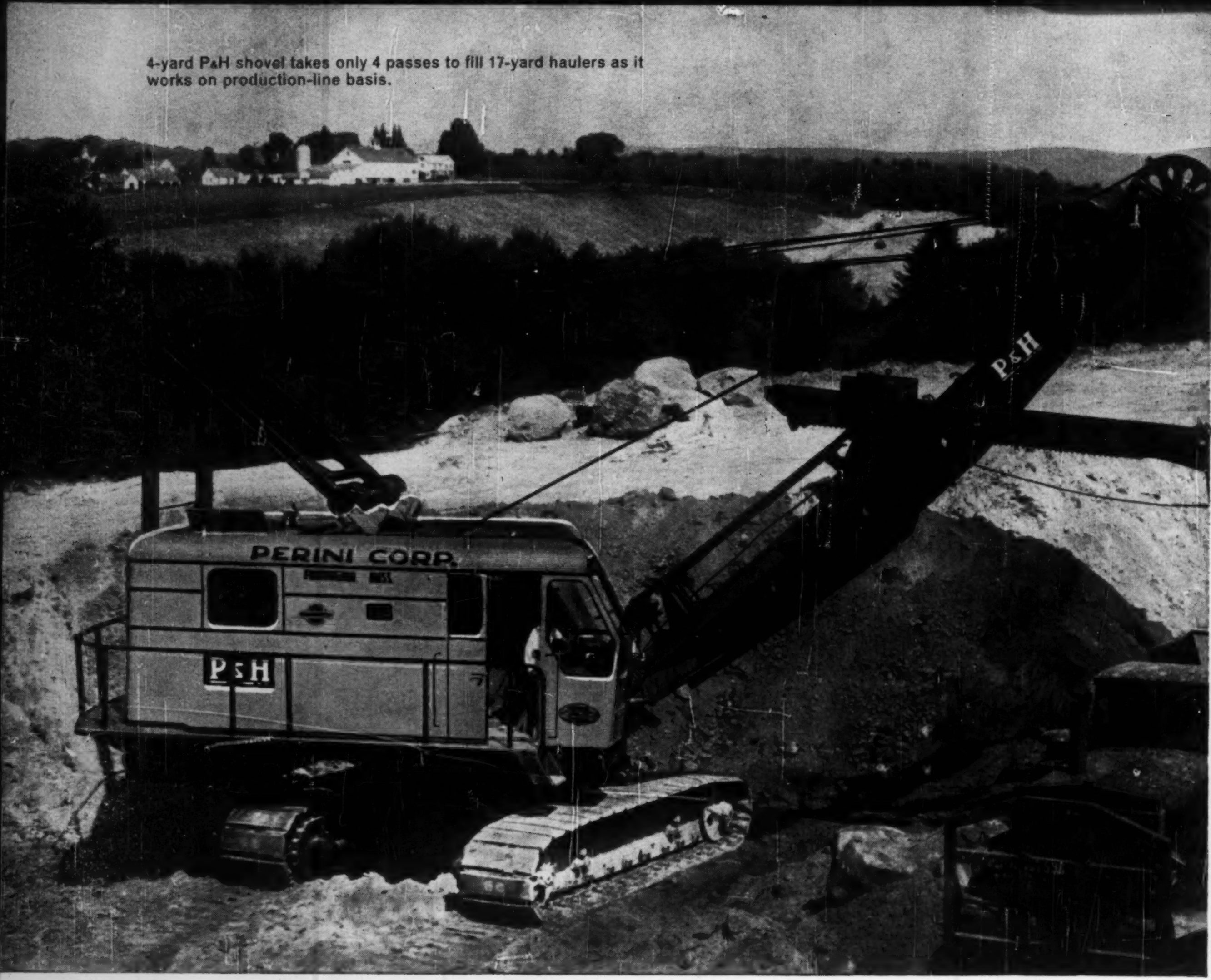
P&H shovel works on uneven ground. On this particular job, the P&H is forced to work on a 20-30% grade and swing while the tracks are on uneven footing, but even after operating under these conditions all day, there is no overheating of the Magnetorque swingers.

A. L. Mattson, Superintendent, says . . . "*This P&H shovel is one of the most modern and easiest to operate machines I have seen. Magnetorque, hydraulic controls and air/hydraulic brakes give our operators perfect control at all times—enable them to get maximum production with minimum effort on their part.*"

For complete information on this job, write for Case History 129 or call your local P&H dealer.

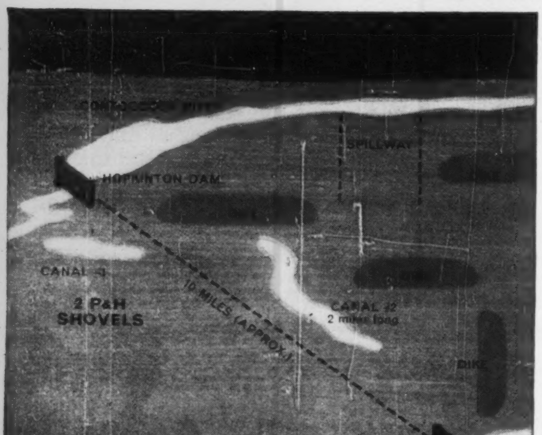
HARNISCHFEGER P&H
Milwaukee 46, Wisconsin

4-yard P&H shovel takes only 4 passes to fill 17-yard haulers as it works on production-line basis.


PERINI CORP.
P&H
P&H

"We need top yardage...we chose

...PERINI CORPORATION, Framingham,

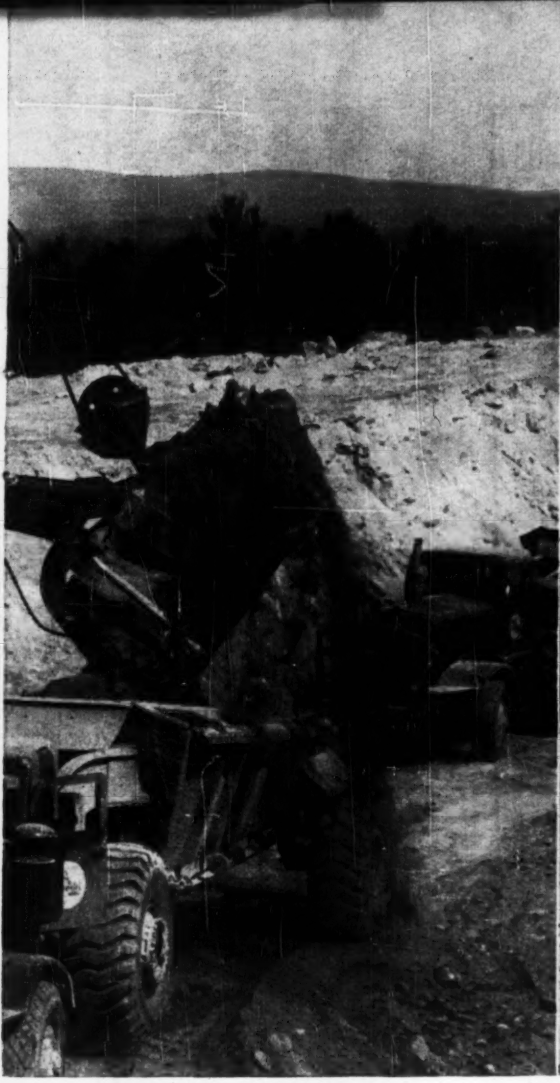

CONTOOCOOK RIVER
SPILLWAY
HOPKINTON DAM
CANAL 4
2 P&H SHOVELS
10 MILES (APPROX.)
CANAL #2
2 miles long
DIKE
EVERETT DAM
PISCATAQUOG RIVER

Drawing shows the overall construction area and details the nine separate phases of operation on this project.

Warren H. Pettengill, Project Manager, reports— *"Our two 4-yard P&H shovels give us faster, smoother work cycles . . . more yardage at the end of the day. This is important on a project that will take 3 years to complete, covers an area of 65 square miles and involves almost 7 million yards of rock, boulders, gravel and earth."*

2 P&H Shovels Team Up On Excavation—Keep Haul Units Hustling

Warren Pettengill used his two P&H shovels as a team to handle the excavation on Canal No. 1. He found that both 4-yard P&H shovels maintained a 20-second work cycle . . . and loaded out the 17-yard capacity haul units in 4 passes. Both P&H machines, equipped with Magnetorque Drive for swing and propel, gave him faster and smoother work cycles . . . more precisely controlled starting and stopping for spotting loads over trucks . . . permitted his operators to maintain 20-second work cycles all day long without tiring them out.



Magnetorque-equipped P&H shovel digs boulders and earth as it makes a complete work cycle every 20 seconds.

PERINI CORP
P&H

P&H rapid-reversing chain crowd provides faster shovel retract and ease of operation — means faster, more positive digging.

P&H works from a bench as it loads hauling unit on a lower grade.

Magnetorque-equipped P&H shovels"

Massachusetts, $8,000,000 Merrimac River Flood Control Project, Hopkinton, N. H.

Top Yardage, On-Schedule-Performance Key To Operation

This flood control project involves many phases of operation, each dependent on the other. Roads must be relocated. Excavated material from canals and spillway must be used as fill in the construction of dikes and dams. A slowdown of yardage or a machine breakdown would seriously hamper coordinated scheduling and construction. Perini's P&H rigs have the built-in ruggedness and durability to stay on the job month after month with minimum downtime for servicing.

P&H Shovels Maneuver Well In Mud

Excavation has been carried out in soft, wet ground that has mired other equipment. The two P&H shovels with single roller crawler assemblies and 36" wide crawler shoes have been able to maneuver without trouble and travel rapidly from one location to another. This is extremely important on this project where continuous production is vital to the overall operation.

For more information on this job, write for Case History Report 130 . . . to the world's largest manufacturer of power cranes and shovels—

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin
CONSTRUCTION & MINING DIVISION

AS YOU PLAN FOR 1961, PLAN ON MAGNETORQUE . . . AND CHOOSE THE RIGHT MACHINE FOR YOUR WORK FROM 40 DIFFERENT MODELS . . . THERE'S A P&H FOR EVERY JOB! . . . WRITE FOR "THE FABULOUS 40"

CIRCLE 183 ON READER SERVICE CARD

(Continued from page 180)

site. $2,000,000. The Cerny Assocs., Inc., 300 First National Concourse Bldg., Minneapolis, archt.

BUILDINGS—SLC

▲ **Tex., Dallas**—BOWLING ALLEY, etc.—Curtis Sanford, 2411 Cedar Springs Rd., soon lets contract bowling alley and stadium center. $1,750,000. Jacob E. Anderson, 614 Thomas Bld., archt. Fuad S. Maayehn, 205 Thomas Bld; and Herman Blum Associates, 4930 Maple Ave., engrs. CD 10/10.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Bids opened 12/7,

Mo.—**Fred Weber Contrs., Inc.,** 7929 Alabama Ave., St. Louis 11, Mo., LB **$2,676,532,** (9 bidders), grade, culverts, 2-24 ft. conc. pavts. 3.414 mi., St. Louis Co.; LB **$2,912,437,** (6 bidders), grad., culverts, 2-24 ft conc. pavts. 5.041 mi., St. Louis Co.,

Mo.— **Joseph L. Pohl, Contr.,** Nevada, Mo., LB **$947,042,** (12 bidders) graded earth, culverts, 2-24 ft. conc. pavts. 3.224 mi. Lafayette Co.; LB **$856,184,** (12 bidders) graded earth, culverts, 2-24 ft. conc. pavts. 2.992 mi. Saline Co.; LB **$2,034,038,** (10 bidders), graded earth, culverts, 2-24 ft. conc. pavts. 4.998 mi. Saline Co. CD 11/14.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Bids opened 12/7,

Mo.—**M. E. Gillioz,** Monett, Mo., LB **$1,499,598,** (5 bidders) 15 units cont. conc. frame, Sta. 19 plus 28, Jackson Co.;

Mo.—**Swenson Constr. Co.,** 3305 Terrace St., Kansas City, Mo., LB **$1,184,951,** (5 bidders) 7 cont. plate girder spans and 23 cont. conc. girder spans, Sta. 99 plus 48, Jackson Co. CD 11/14.

▲† **Cook Constr. Co.,** Hy 80 W., P.O. Box 8466, Jackson 4, Miss., CA **$3,365,982,** est. $2,941,165 (4 bidders), completion embankment, Pomona Dam and Reservoir incl. clearing and grubbing, earth embank 4 m.c.y. near 100 Mile Creek, ENG-23-028-61-28, KANSAS. U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. Bids Dec. 6. CD 11/1.

▲† **George A. Fuller Co.,** 3100 8 St., Los Angeles, Calif., **Del E. Webb Contr. Co.,** 5101 San Ferdinando Rd. W., Los Angeles, Calif. and **Paul Hardeman, Inc.,** 10579 Dale St. Stanton, Calif., CA **$30,766,492,** est. $30,000,000, Titan Missile launching facilities, McConnell Air Force Base, ENG-04-548-61-3, WICHITA, KAN. U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. Ralph M. Parsons Co., 617 W. 7, Los Angeles, Calif. and Wilson & Co., 631 E. Crawford St., Salina, Kan., engrs. Bids Dec. 13. CD 10/28.

▲**TEXAS**—State Hgy. Comn., Austin, Bids opened 12/13,

Tex.—**Concho Constr. Co., Inc. & T. L. James & Co., Inc.,** 5622 Dyer St., Dallas, Tex., LB **$2,170,229,** grading, strs., st. sew and con. pvt., 0.987 mi. Hy. IH 20, Proj. I 20-5(31), Dallas Co., ·

Tex.—**Ivan Dement, Inc.,** Box 1787, Amarillo, Tex., LB **$923,499,** grading, strs., fl. base and b. conc. 13.216 mi. Hy. U. S. 60, Proj. F 174(7), Deaf Smith Co.,

Tex.—**Harrison Eng. & Constr. Corp.,** 3706 Broadway, Kansas City, Mo., LB **$953,821,** grading, strs., concrete 3.632 mi. Hy St. 332, Proj S 1777(7), Brazoria Co., CD 11/25.

▲ **J. H. Pomeroy & Co.,** 755 Sansome St., San Francisco, Calif., **Bates & Rogers Constr. Corp.,** 600 W. Jackson Blvd., Chicago, Ill., **J. Rich Steers, Inc.,** 17 Battery Pl., New York, N. Y. and **Hawaiian Dredging & Constr. Ltd.,** 1350 Ala Moana, Honolulu, Hawaii, LB **$78,907,000,** est. $15,816,560, Minuteman Ballistic Missile Complex, Malmstrom Air Force Base, ENG.-04-548-61-1 GREAT FALLS, MONT. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids Dec. 13. CD 11/30.

BUILDINGS—LB & CA

▲ **The Ravoux Co.,** 1725 Carroll Ave., St. Paul, Minn., Owner Builds, **$2,500,000,** 3 to 4 story, 200 unit MOTEL, incl. swimming pool, Rice St. and Rondo Ave., ST. PAUL, MINN.

▲ **Randolph Constr. Co.,** Arnold, Mo., Owner Builds, **$2,000,000,** (3-4 Year Program), First Year over $500,000, 300 one story RESIDENCES near Meramec River on US No. 61, vicinity of Maxville, ARNOLD, MO.

▲ **C. H. Leavell & Co.,** 1900 Wyoming St., and **Dan R. Ponder, Inc.,** 327 Morgan Ave., El Paso, Tex., CA **$3,425,000,** 410,000 sq. ft. masonry SHOPPING CENTER, EL PASO, TEX. Bassett Shopping Center, 939 Sand Hill Freeway, El Paso, Tex. Bartlett Cocke, 3501 Broadway Ave., San Antonio, Tex., archt. CD 6/1.

▲ **Texas Gulf Producing Co.,** Bank of Southwest Bld., Houston, Tex., Owner Builds, **$1,350,000,** gas-processing condensate fractionation PLANT unit, 80,000 gal. cap. liquid daily, near ODESSA, TEX.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

January 6 Arizona **January 11, 12 California**

▲† **Calif., El Toro**—PUBLIC QUARTERS—BA 1/11—11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego, Zone 1, convert Wherry Housing to public quarters, Marine Corps Air Facility, Spec. 19541. $1,000,000-$2,500,000. CD 9/8/58.

NOW—4 HOUR UL RATING FOR CONCRETE-FILLED COLUMNS

Tubular concrete-filled columns were used in the new Detroit warehouse of the Scott Paper Co. Architect-Engineers, the Ballinger Co.; General Contractor, Perron Construction Co.; Structural Steel Fabricator, Whitehead and Kales.

Concrete-filled columns by Tubular with a four hour UL rating add fire resistance and strength to structures. You can upgrade your designs to four hour UL rating by specifying Tubular *concrete-filled* fireproof columns.

Controlled methods of filling, metered water, controlled aggregate and vibration assure that our concrete-filled pipe and tubing columns offer greater strength and fire resistance than unfilled columns, for less than 1% structural cost.

Available in either round or rectangular sections. Round columns are the most efficient column sections and have a finished appearance without expensive boxing. Painting is the only finishing needed.

Rectangular concrete-filled columns fit into walls and can serve as window mullions in addition to giving structural support.

Tubular's experience and specialized equipment assure delivery to specs on time and within budget.

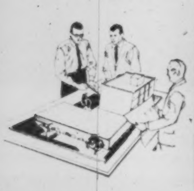
Send for our catalogues or check Sweet's 1961 Architectural and Industrial File. Phone: Souderton, PA. 3-4365—Phila. CH 8-4465

TUBULAR Products, Inc.
SOUDERTON, PA.

CIRCLE 51 ON READER SERVICE CARD

MODELS of any object or product, animate or inanimate

Office, factory and apartment building models accurately detailed interior and exteriors.



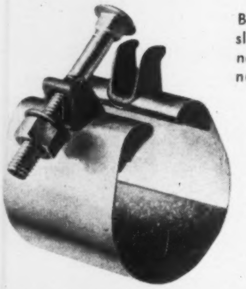
Diorama Displays for Advertising and Public Relations Promotions.
Write for folder.

your BEST SOURCE for Miniature Scale Models

JOHN H. WELLS & ASSOCIATES
35 East Wacker Drive • Chicago 1, Illinois • DE 2-6033

CIRCLE 184 ON READER SERVICE CARD

STOP PIPE LEAKS with Adams "Pipe Saver" Clamps


Bolt drops into slotted lug—No need to remove nut
Stainless Steel Band
Neoprene Gasket

NO NEED TO REPLACE leaking pipes! No need for complete line shut-down! When leak occurs, just snap an Adams "Pipe Saver" repair clamp on pipe and tighten bolt. Leak is stopped—instantly, completely, permanently! Use on gas, oil, water and steam lines.

Adams Clamps are UNEQUALLED:
- Resilient neoprene gasket
- Stainless steel band
- Patented contour lug design
- Many in service over 20 years

WRITE today for literature and prices.

Adams PIPE REPAIR PRODUCTS
2453 Merced Avenue (P. O. Box 3367)
South El Monte, California
Sales Office and Warehouse: Columbia, Pa.

CIRCLE 52 ON READER SERVICE CARD

▲ **Calif., Los Angeles**—PASSENGER CARGO TERMINAL—BA 1/17—Los Angeles Harbor Dpt., City Hall, passenger cargo terminal at Berth 93-A and 93-B, Los Angeles Harbor, San Pedro. $4,500,000. CD 9/8/58.

BUILDINGS—BA

▲† **Idaho, Mountain Home**—FAMILY HOUSING—BA 1/12—Procurement Office, Mountain Home Air Force Base, 300 unit frame family housing, Mountain Home Air Force Base, Inv. 61-24, $3,500,000. Plans deposit $100. CD 5/20, under LB.

▲ **Calif., San Diego**—SCHOOL—BA 1/17—San Diego Unif. School Dist., 4100 Normal Blvd., Zone 3, 110,300 sq. ft., frame, stucco Taft Junior High School, Mission Village. $1,500,000. Plans deposit $15. Wulff & Fifield, 1422 6 Ave., Zone 1, archts. CD 2/3.

▲ **Wash., Seattle**—CONCERT-CONVENTION HALL—BA 1/18—City, Bd. P. Wks., County-City Bldg., converting civic auditorium into concert-convention hall. $2,500,000. Plans deposit $100. B. M. Priteca & J. J. Charelli, Palomar Bldg., Seattle, Wash., archts. CD 10/24/58.

HEAVY CONSTRUCTION—LB & CA

▲ **ARIZONA**—State Hy. Dpt., 206 S. 18th Ave., Phoenix,
The Ashton Company, Inc., P.O. Box 7065, Tucson, Ariz., CA **$1,191,503**, grading, select material, aggregate base, b. conc., emulsified asphalt seal coat, construction 2 interchange structures, beginning at Yuma-Maricopa Co. line, U.S. Rte. 80, 26 mi. southwest Gila Bend, extending northeasterly toward Gila Bend, approx. 8.2 mi., Yuma-Casa Grande Hy., Maricopa Co. Bids Nov. 23, awarded Dec. 8. CD 11/28, under LB.

▲† **Gibbons & Reed Co.**, 825 W. 9th St. N., Salt Lake City, Utah, and **G. Ball, Inc.**, 300 Camille Ave., Box 278, Danville, Calif., CA **$3,096,380**, runway and taxiway paving and lighting, Fairchild Air Force Base, SPOKANE, WASH. U. S. Eng., 1519 S. Alaskan Way, Seattle, Wash. Bids Dec. 7. CD 12/12, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 12/8,
Guy F. Atkinson Co., 10 West Orange Ave., South San Francisco, Calif., LB **$4,897,617**, (9 bidders), eight lane freeway viaduct and grading, surf. ramps and structures on Santa Monica Freeway between Vermont Ave. and 1/10 mi. east of Oak St. in Los Angeles, Los Angeles Co. CD 11/2.

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles,
Fredrickson & Watson Constr. Co. and Jack L. Adams Constr. Co., 873 81 Ave., Oakland, Calif., CA **$4,008,086**, grading, paving to constr. 1.9 mi. 8 lane freeway on San Diego Freeway between 0.4 mi. east of Alameda St. and Carson St., Los Angeles, Los Angeles Co. Bids Dec. 1, awarded Dec. 13. CD 12/6, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Fredrickson & Watson Constr. Co. and Lew Jones, 873 81 Ave., Oakland, Calif., CA **$6,946,163**, 2,800 ft. and 8,800 ft. bridges and 4,710 ft. earthfill between them to provide alignment across Yolo-By-Pass, Hy. 40 west of Sacramento, 5.7 mi. six lane freeway, Yolo Co. Bids Nov. 30, awarded Dec. 8. CD 12/2, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Grafe-Callahan Constr. Co., 714 West Olympic Blvd., Los Angeles, Calif., CA **$3,431,743**, constr. Oregon Mountain Tunnel north approach embankment and ventilation bldg. US Hy. 199 about 2.5 mi. south of Oregon Border, Del Norte Co. Bids Nov. 30, awarded Dec. 8. CD 12/2, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Peter Kiewit Sons Co., 345 Kieways Ave., Arcadia, Calif., CA **$5,715,935**, grading, paving and bridges 8 lane freeway for 4.7 mi. between 0.7 mi. north of 208 St. and 0.4 mi. south Pacific Coast Hy. near Wilmington, Harbor Freeway, Los Angeles Co. Bids Nov. 10, awarded Dec. 7. CD 11/16, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles,
J. A. Thompson & Son, 8330 Hindry Ave., Los Angeles, Calif., CA **$1,433,607**, four structures, grading, surf. roadway approaches on future San Diego Freeway Rte. between 0.8 mi. north of Manchester Blvd. and 0.1 mi. north of Vesta St. near Inglewood, Los Angeles Co. Bids Nov. 25, awarded Dec. 8. CD 12/5, under LB.

▲† **General Electric Co.**, 570 Lexington Ave., New York 22, N. Y., CA **$1,581,284**, Central Valley Proj., furnishing, installing two 74,444 kva generators for Clear Creek Power Plant, Redding, Shasta Co., Spec. DS 5404, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo. Bids Nov. 10. CD 11/21, under LB.

▲ **Pascal & Ludwig, Inc., and Phalcon Constr. Co., Inc.**, 2240 Parkway Dr., El Monte, Calif., CA **$1,529,272**, Proj. 534, Lennox Storm Drain, Lennox, Inglewood and Hawthorne, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Nov. 18, awarded Dec. 6. CD 11/28, under LB.

▲ **I. C. Curry, Inc.**, P.O. Box 150, San Diego 12, Calif., LB **$1,210,031**, Base Bid (13 bidders), Warehouse "B", 10th Ave. Marine Terminal, SAN DIEGO, CALIF. City, Purchasing Agent, Rm. 161, Civic Center, 1600 Pacific Hy., San Diego 1, Calif. Bids Dec. 13. CD 11/10.

▲ **Dorfman Constr. Co.**, 124 North La Brea, Los Angeles, Calif., CA **$1,518,669**, est. $1,489,674, constr. Mira Mesa sewers and pump station, SAN DIEGO, CALIF. City Council, Rm. 356, Civic Center, 1600 Pacific Hy., San Diego 1, Calif. Bids Nov. 30, awarded Dec. 6. CD 12/6, under LB.

BUILDINGS—LB & CA

▲ **John E. Branagh & Son**, 42 La Salle Ave., Piedmont, Calif., CA **$3,871,000**, fifty BUILDINGS, HOUSING, 500 Apartments for Married Students University of California, BERKELEY, CALIF. Regents of University of California, c/o Architects & Engineers, No. 2 Barrow Lane, Berkeley, Calif.

▲ **Heller-Nielsen Constr. Co.**, P.O. Box 2551, Secramento, Calif., LB **$3,666,000** (8 bidders), general contract 6 story, 562,400 sq. ft. HEARQUARTERS OFFICE, Dpt. Motor Vehicles, W.O. 4208SC, SACRAMENTO, CALIF. State Div. Architecture, 1120 N St., Sacramento, Calif. Bids Dec. 13. CD 11/14.
Monterey Mechanical Co., 8275 San Leandro St., Oakland, Calif., LB **$2,178,467** (3 bidders), mechanical work for Headquarters Office, Dpt. Motor Vehicles (Sacramento, Calif.).
Patterson-Emerson-Comstock, Inc., 3247 Grand Ave., Oakland, Calif., LB **$985,518** (6 bidders), electrical work, Headquarters Office, Dpt. Motor Vehicles (Sacramento, Calif.).
Valley Elevator Co., 1606 D St., Sacramento, Calif., LB **$602,334** (4 bidders), electric stairways and dumbwaiters, Headquarters Office, Dpt. Motor Vehicles (Sacramento, Calif.).

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **McNamara Constr. Co., Ltd.**, 42 Industrial St., Leaside, Ont., CA **$3,954,000**, Stage 5, Lakehead Harbor Imprvs., Thunder Bay Dist., PORT ARTHUR, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Nov. 9, awarded Dec. 5. CD 11/15, under LB.

BUILDINGS—LB & CA

▲ **Cadillac Contracting & Development Ltd.**, 99 Avenue Rd., Toronto, Ont., CA Est. **$3,000,000**, SHOPPING CENTRE, OAKVILLE, ONT. Oak-Queen Shopping Centre, c/o White, Bristol, Beck & Phipps, 335 Bay St., Toronto, Ont. Bregman & Hamann, 146 Bloor St. W., Toronto, Ont., archts. CD 3/24.

▲ **Trudelle Court Apartments, Ltd.**, c/o Proctor & Redfern, engrs., 75 Eglinton Ave. E., Toronto, Ont., Owner Builds, **$1,394,775**, low rental HOUSING, Eglinton Ave. E. and Danforth Rd., TORONTO, ONT.

air-cooled power
pays off!

WISCONSIN-POWERED LOADER — made by ULMac Equipment Co., Inc., El Paso, Ill. — speeds ditching, stripping, widening, borrowing, and windrow loading. A sudden freeze will not disable the air-cooled Wisconsin or your equipment.

56-hp WISCONSIN ENGINE

loads 15 cu. yds. min.—slashes upkeep

The 56-hp air-cooled Wisconsin offers you king-size power and economy. Its rugged all-weather dependability enables equipment like this ULMac loader to earn its keep — *and more!*

The husky Wisconsin has no radiator, water pump, fan belt, or other water-cooling frills to run up cost and upkeep. There's no water to haul — no anti-freeze to buy — and no conditioning routine for winter and summer use.

The Wisconsin is precision-fitted for long life. Its high torque pulls the engine through shock loads without stalling — keeps your job on schedule.

Power your equipment with air-cooled Wisconsin Engines — 3 to 56 hp. Send for Bulletin S-251. Write to Dept. C-10.

MOST H.P. HOURS

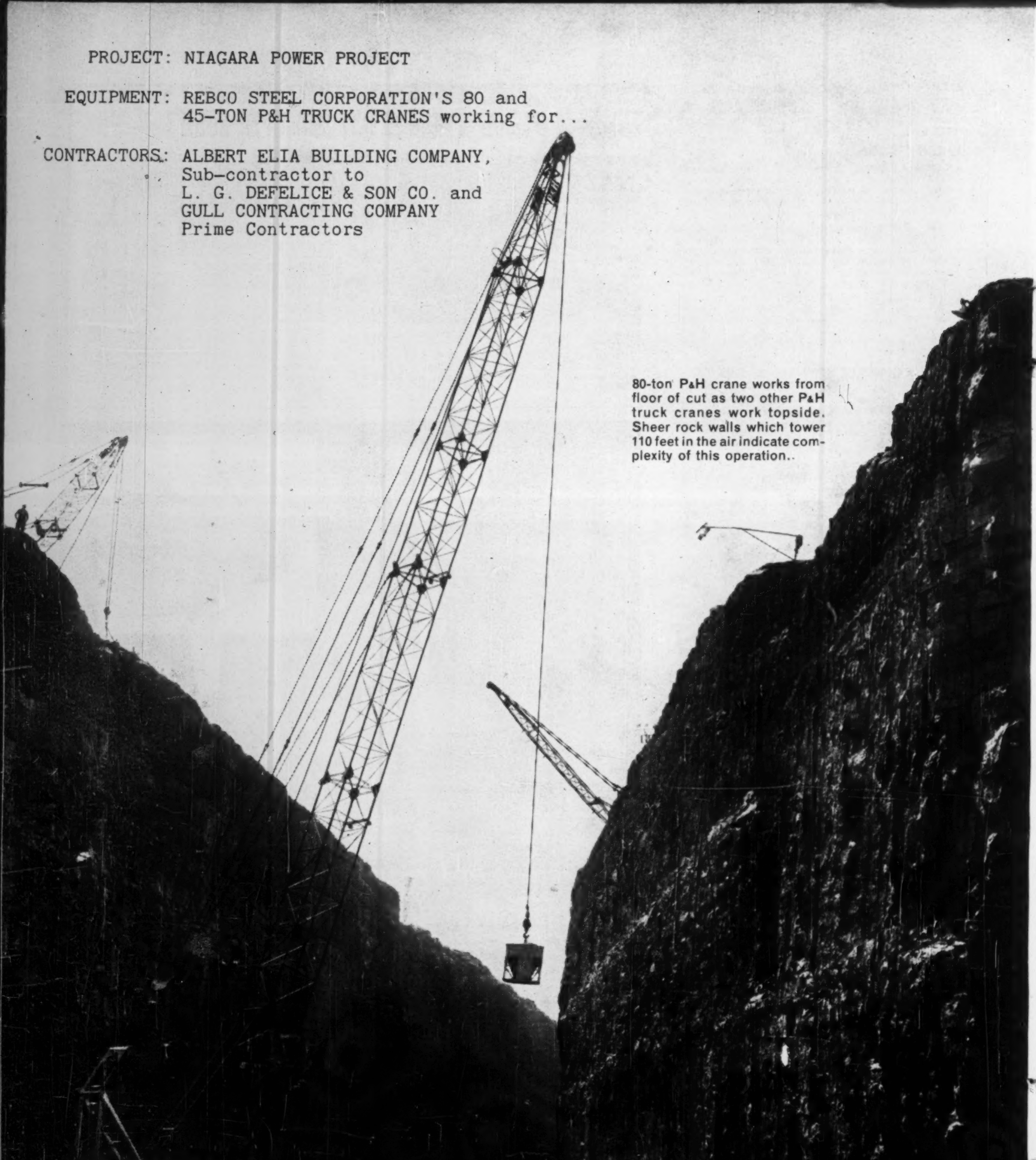
WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

C-227

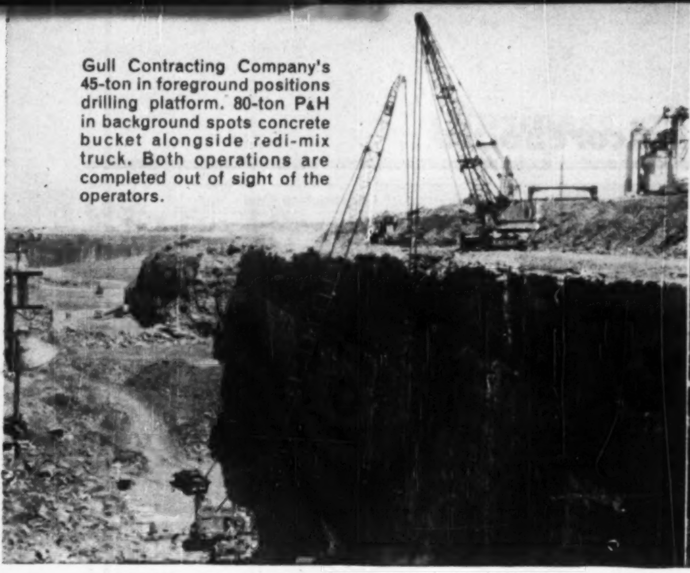
PROJECT: NIAGARA POWER PROJECT

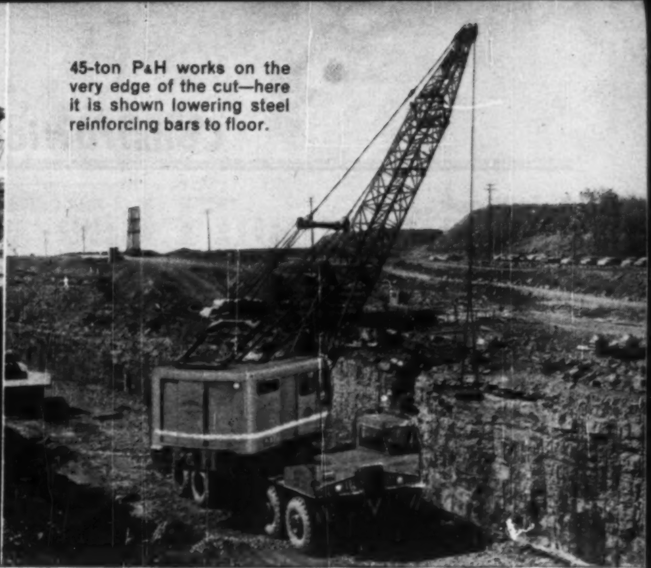
EQUIPMENT: REBCO STEEL CORPORATION'S 80 and
45-TON P&H TRUCK CRANES working for...

CONTRACTORS: ALBERT ELIA BUILDING COMPANY,
Sub-contractor to
L. G. DEFELICE & SON CO. and
GULL CONTRACTING COMPANY
Prime Contractors



80-ton P&H crane works from floor of cut as two other P&H truck cranes work topside. Sheer rock walls which tower 110 feet in the air indicate complexity of this operation..


Gull Contracting Company's 45-ton in foreground positions drilling platform. 80-ton P&H in background spots concrete bucket alongside redi-mix truck. Both operations are completed out of sight of the operators.


45-ton P&H works on the very edge of the cut—here it is shown lowering steel reinforcing bars to floor.

Magnetorque is Key to Vital Operation as

3 P&H cranes help harness the mighty Niagara

Joe VeRost, Rebco Steel Corporation's Vice President reports—*"The unusual conditions here at Niagara forced Albert Elia to operate the 80-ton P&H from the floor of the 110-foot deep cut . . . picking up concrete from a point on top of the cut, out of sight of the operator . . . swinging it out and over and lowering it to the bottom for the pour. In my opinion this could not have been done without Magnetorque swing drive."*

80-ton P&H "Feels in the Dark"

Sitting at the bottom of the cut and swinging 160 feet of boom, Rebco's 80-ton P&H truck crane reached up and over the 110 foot wall to pick up loaded 2-yard concrete buckets that were out of sight. It swung them smoothly and easily up and over the lip and lowered them to the floor, where it poured concrete in flat forms. This "out-of-sight" operation was controlled and directed by telephones between the operator and the concrete foreman. Pin-point positioning with 160 feet of boom—no simple task in itself—was made even more critical by the need to work this long boom "within inches" of the wall. It calls for extreme skill and smooth, immediate-action controls.

Mike Comerford, operator, praises Magnetorque—"Without Magnetorque controlled swing it would have been almost impossible to handle this job. With friction clutches, the boom whip would have been too violent—it would not have been possible to swing a few inches at a time. We have been making complete cycles in 2 minutes including pouring which required walking the bucket. To top it off we had to make 180 degree swings."

45-ton P&H works topside—fishes deep

Rebco's 45-ton P&H truck crane, sitting on the very edge of the 110 foot cut, constantly lowered reinforcing steel, equipment and concrete to the floor below. Operator Tom Wagner was also forced to operate "in the dark," receiving directions and instructions by phone. Tom Wagner says—"Smooth operation and accurate positioning of loads were possible with the immediate-action hydraulic control system of the P&H. It gave me more immediate control—and that's what we needed on this job."

45-ton P&H truck crane positions drilling rig

A 45-ton P&H, belonging to Gull Contracting Company, operated from the top of the cut where it supports a movable drilling platform some sixty feet down the side of the sheer wall. "Triple-safe" Planetary Boom Hoist assured positive holding of the platform as holes were drilled in the side of the rock wall for steel reinforcing bars. The P&H lowered or raised the platform to new positions as soon as the holes were drilled.

P&H gives unmatched performance

Rushing for completion of this huge project, contractors are putting men and equipment to extreme tests. Operating a two-shift program of ten hours each, the P&H truck cranes are used constantly, twenty hours out of the twenty four . . . six days out of the week. Under extreme endurance tests like this, P&H durability and ruggedness stand out . . . actually deliver more working time on the job.

For complete information on this job, write for Case History 121 . . . to the world's largest manufacturer of power cranes and shovels—

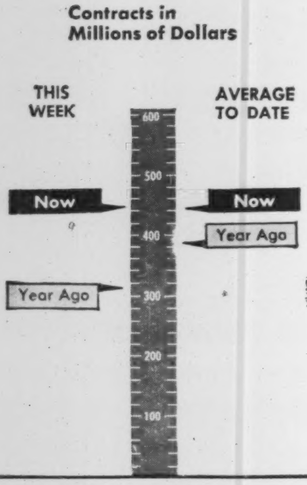
HARNISCHFEGER **P&H**
Milwaukee 46, Wisconsin

AS YOU PLAN FOR 1961, PLAN ON MAGNETORQUE . . . AND CHOOSE THE RIGHT MACHINE FOR YOUR WORK FROM 40 DIFFERENT MODELS . . . THERE'S A P&H FOR EVERY JOB! . . . WRITE FOR "THE FABULOUS 40"

CIRCLE 187 ON READER SERVICE CARD

Construction Scoreboard

This Week...



AMOUNT OF CONTRACTS LET

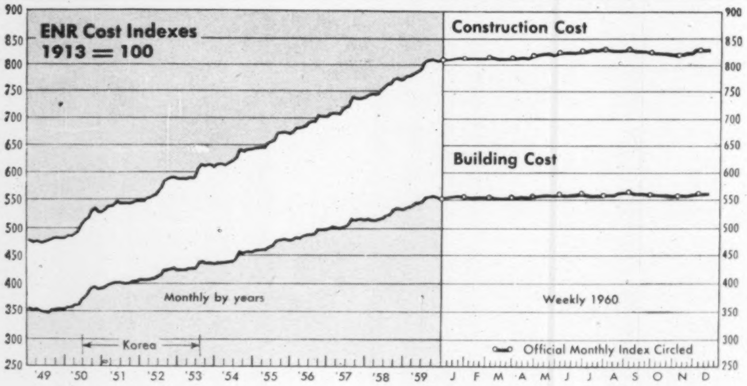
Contracts Awarded In 50 States By Type	This Week millions	Cum. 51 wks 1960 millions	Chge '59-'60 %
All Heavy Construction	$443.9	$22,604.5	+14
By Ownership			
PRIVATE	158.6	12,103.3	+20
PUBLIC	285.4	10,591.2	+ 9
State & Municipal	194.5	8,191.2	+18
Federal	90.9	2,400.0	−13
By Type of Work			
PUBLIC			
Waterworks	5.3	450.5	+22
Sewerage	17.3	597.4	− 6
Bridges*	23.9	787.6	+42
Highways	112.5	3,374.6	+20
Earthwork, Dams & Waterways	33.1	772.1	−11
Buildings:			
Excl. Housing	23.1	2,495.4	− 1
Housing	24.5	704.7	+21
Unclassified	45.6	1,417.5	+ 3
PRIVATE			
Buildings:			
Mass Housing	82.4	5,746.0	+25
Commercial	22.3	2,506.9	+20
Industrial	48.9	2,761.3	− 6
Unclassified	5.0	990.5	+101

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

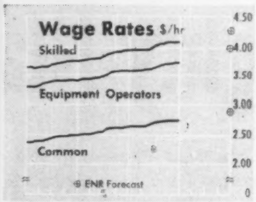
NEW CONSTRUCTION CAPITAL

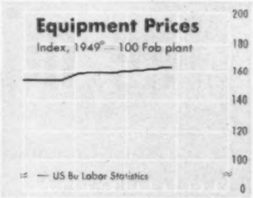
	Week of Dec. 15 millions	Cum. 50 wks millions	Chge '59-'60 %
Corporate Securities	$158.9	$ 3,675.9	−12
State and Municipal:			
All Except Housing	119.9	6,108.5	+ 5
Housing	....	215.9	+80
Federal Loans	1.6	177.4	+30
Federal Aid	....	3,228.4	− 3
Total Nonfederal	$280.4	$13,406.1	−− 1
Federal Appropriations:			
Projects in U. S.	....	$ 3,165.6	−11
Outside U. S.	....	159.1	+610
Total New Capital	$280.4	$16,730.9	− 3

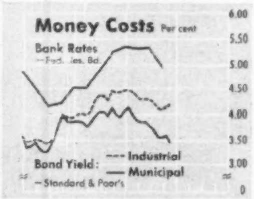


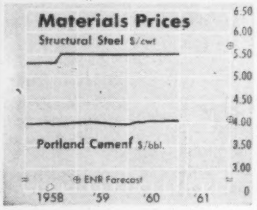
ENR INDEXES (1913=100), 20 cities' average	Week of Dec. 15 1960	% Change from Nov. 17 1960	% Change from Dec. 17 1959
Construction Cost	830.53	+0.07	+2.6
Building Cost	561.42	+0.09	+1.5

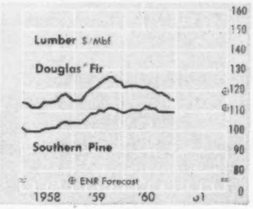
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

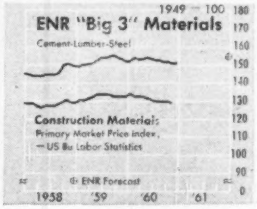












ENR COST INDEXES IN 22 CITIES, 1913=100

City	Construction Cost Dec. 1960	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Dec. 1960	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	652.78	+0.8	+4.8	504.08	+1.1	+1.0
Baltimore	753.21	−0.2	+1.1	559.05	−0.3	+0.2
Birmingham	674.37	0	+3.4	525.80	0	+2.1
Boston	848.65	+1.3	+3.2	572.22	+0.2	+3.2
Chicago	911.09	−0.4	−0.6	586.15	−0.6	+1.1
Cincinnati	839.35	0	+3.2	545.13	0	+1.2
Cleveland	944.49	+0.1	+2.6	561.64	+0.2	+1.3
Dallas	640.32	+0.2	+6.0	525.04	+0.2	+7.1
Denver	756.22	0	+1.3	552.27	0	+1.4
Detroit	963.54	0	+2.3	605.32	0	+1.7
Kansas City	812.58	0	+1.8	553.13	0	+0.08
Los Angeles	900.59	0	+3.7	561.09	0	+1.3
Minneapolis	884.84	0	+3.0	575.71	0	+1.2
New Orleans	649.27	0	+1.3	507.84	0	−0.6
New York	1,035.74	−0.1	+2.7	645.36	−0.1	+0.4
Philadelphia	830.49	+0.02	+5.0	589.86	+0.02	+2.1
Pittsburgh	885.14	0	+4.2	625.80	+0.7	+4.2
St. Louis	900.56	0	+3.1	576.47	0	+1.0
San Francisco	876.28	−0.2	+3.1	553.49	−0.2	+0.8
Seattle	852.90	0	+2.7	503.89	0	+0.8
U. S.—20 Cities' avg.	**830.61**	**+0.06**	+2.7	**561.50**	**+0.06**	+1.6
Montreal	648.79	0	+2.9	464.48	0	+1.2
Toronto	689.98	0	+5.0	492.11	0	+0.8

Business and Finance

State Problem No. 1: Road Financing

Preliminary information gathered by ENR indicates that highway-financing battle lines are being drawn rapidly in the states as the time for legislative sessions draws closer. Proposals to increase existing taxes, introduce new ones, sell bonds or shift to a different revenue source are starting to fly thick and fast.

The pattern is already clear; the tax most easily collected—the gas levy—is a candidate for a boost in 10 states— California, Hawaii, Iowa, Maine, Minnesota, Missouri, Pennsylvania, Vermont, Washington and Wyoming. Chances are good that the same proposal will pop up in several more after highway officials take a closer look at the needs of their respective states.

Whether the gas tax will actually be boosted in all the states where it has been recommended is another question. Petroleum interests will oppose every increase proposal tossed in the air; highway builders' organizations and various citizens groups will fight for them.

California's public works officials told a legislative group that it will take $6.5 billion to construct highways capable of meeting the traffic of 1970. To meet 1980's needs will require $11.3 billion. Not included in these figures are outlays for county roads and city streets—another $13 billion by 1980. A one-cent per gallon boost in the gas tax has been recommended.

Iowa's legislative road committee has two reports in hand, one setting forth the state's future needs and another on how to pay for them. The Automotive Safety Foundation of Washington, D. C. recommends that $5.5 billion be spent by 1980 to modernize Iowa's 112,000-mile system of highways, county roads and city streets. The Public Administration Service of Chicago says that the needed construction cannot be bought with revenue received under current rates of taxation. It suggests higher gas taxes, higher sales taxes, higher motor vehicle registration fees and elimination of fuel tax refunds to farmers.

Gov. David L. Lawrence of Pennsylvania will make a second attempt to obtain an increase in the gasoline tax or motor vehicle license fees. He failed to obtain a one-cent boost in 1959. Unless additional revenue is obtained, the state will be unable to expand its road program, according to Park H. Martin, Secretary of Highways.

Colorado and North Dakota legislative committees will consider proposals to boost truck and automobile license fees. The Colorado Motor Carriers Association asked that the ton-mile truck tax be eliminated, but that truck registration fees be boosted sharply. Maximum registration fee for trucks is now $17.50, plus the ton-mile levies. The association recommends that fees run from a low of $7 to a high of $1,075. It contends this fee schedule would yield at least $8 million for highways, close to revenues received under existing levies.

North Dakota's Legislative Research Council wants license fees for both passenger cars and trucks boosted.

Of all the states, however, Kentucky appears to be in the best shape. It has authority to sell $125 million worth of bonds for highway construction. This is more money than will be forthcoming in federal-aid funds at the present rate of reimbursement. Highway Commissioner Henry Ward is considering spending money now for the Interstate against federal funds to be received in the future. In this way, the state could obligate about $40 million in new road projects by July 1. If forced to spend at the present rate of federal reimbursement, only $21 million worth of highway work could be obligated. Mr. Ward says that although the plan is subject to approval by the Bureau of Public Roads, he has been told it could be done in full compliance with federal requirements.

In the background is the problem of compact cars. Most of the estimates of revenue needs apparently are based on gasoline consumption by standard-size cars, with revenue projections assuming that consumption of gasoline will increase at historical rates. New York, however, is taking a realistic look at car usage.

This week, the state's Bureau of Motor Vehicles and the Department of Taxation and Finance reported that a preliminary survey shows that compact cars may cost the state $3 million a year in tax revenue, because they are lighter and use less gasoline than standard-size models. Officials reported New York will lose almost $2 million in gas tax revenues and about $1.1 million in registration fees, which are based on car weight.

Contractors See a Good '61

Most contractors think 1961 will be a good year for business.

That optimistic viewpoint is reflected in answers to a detailed questionnaire sent to a random sample of ENR's contractor-readers.

A phenomenal 90% of those who replied said they expect their volume next year to remain the same as in '60 or increase—44% expect 1961 to be a better year than 1960; 46% thought it would be about the same.

The questionnaire also gathered information about equipment purchases during 1960 and buying plans for 1961.

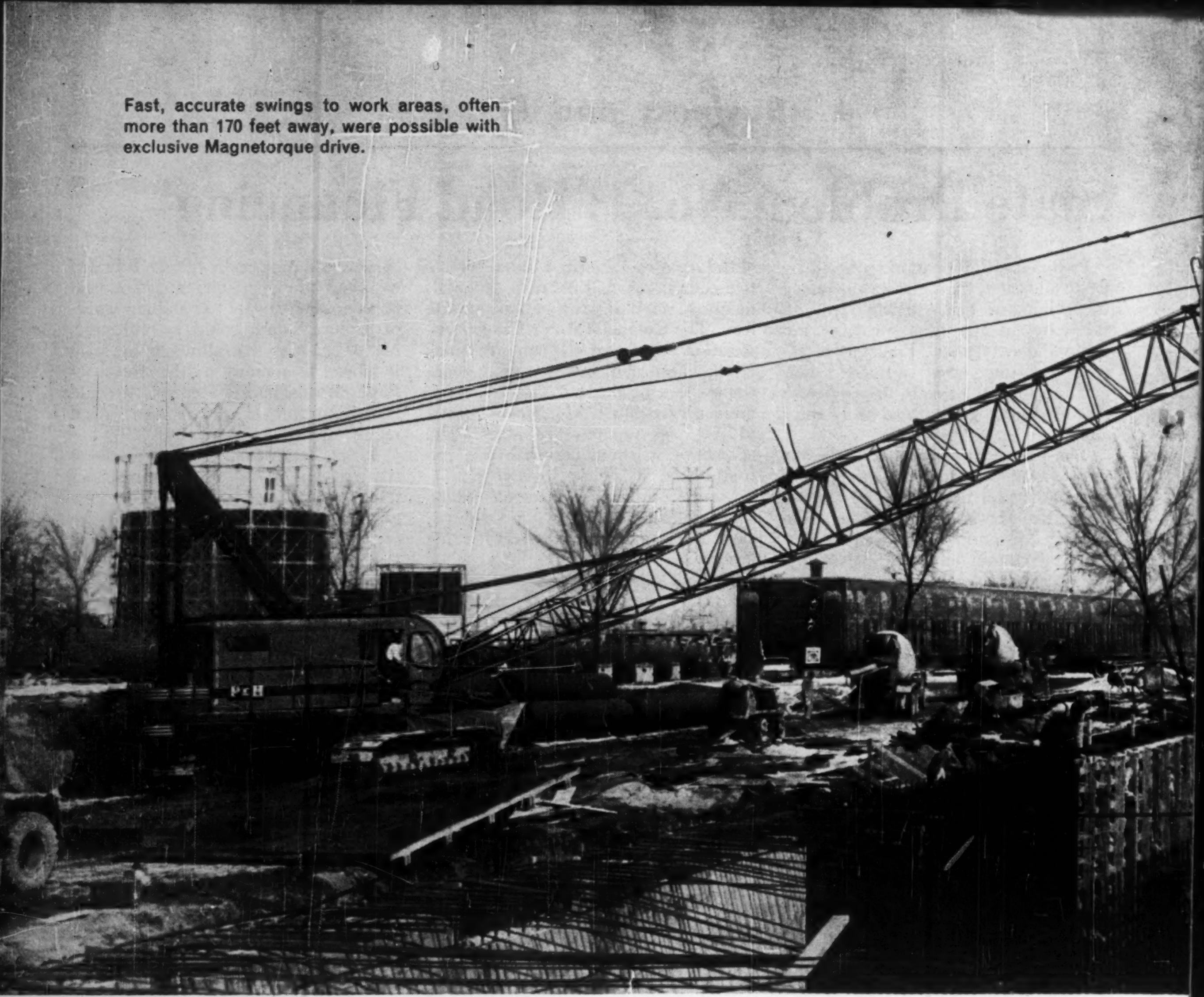
Better than eight of 10 contractors reported either buying or renting construction equipment during 1960. Of these, 65% bought one or more pieces of equipment. Of those who bought, 86% bought new equipment and half of those who bought new equipment also purchased used machines.

The average contractor reported buying 5.3 units of equipment. Average purchases ranged from 2.5 units for the smallest contractors to more than 16 for the largest outfits.

As might be expected, future buying plans are uncertain—even as little as six months ahead. About one-third of the contractors who were active in the equipment market in 1960 announced definite intentions to buy specific types of equipment during the first six months of 1961. These buyers plan to acquire roughly the same number of machines in the first half of 1961 as they bought in the corresponding period of 1960.

More than 20% of the contractors answered "don't know" to queries about 1961 buying plans. Many noted that their equipment purchases would depend directly on their success in bidding future jobs. Less than one-quarter of the contractors who were active in the equipment market in 1960 stated definitely that they planned to buy no equipment during the first six months of 1961.

Volume of equipment rental can be expected to increase next year, since 22% of the contractors plan to rent more equipment than in 1960. A sizable 63% plan about the same volume of machine rentals in 1961 as this year.



Fast, accurate swings to work areas, often more than 170 feet away, were possible with exclusive Magnetorque drive.

"Long reach with Magnetorque swing makes the difference ...it's the key to efficient operation"

... J. L. SIMMONS COMPANY INC., CONTRACTORS—NORTH SIDE SEWAGE TREATMENT WORKS OF GREATER CHICAGO

One of the nation's oldest contractors reports on his 110-ton P&H Crawler Crane operation.

Here's what F. A. Miller, Construction Manager has to say . . . "*Without a doubt, our 110-ton P&H Crane has been the key to this operation. Its lived up to our every expectation. For example—we've poured concrete over 170 feet away with a 200 foot boom and a 1-yard bucket . . . over 150 feet away with a 2-yard bucket. Its got the fastest, controlled swings of any crane I've seen. We're ahead of schedule and our work is proceeding smoothly, efficiently as planned . . . thanks to our P&H.*"

Long Reach—the ability to handle up to 300 feet of boom permitted J. L. Simmons Company to work from the perimeter of the job and spot light loads anywhere . . . resulted in faster, more economical construction, more efficient operation.

Fast, Effortless Swings—with exclusive Magnetorque® drive. The big crane gave Simmons more work loads per hour and smoother, more accurate starting and stopping . . . Highly important in this operation where long, safe swings were a necessity.

Big Capacity—with a rating of 110 tons, the P&H had more than enough capacity to handle the big work loads of concrete and equipment at those far-

Long reach of the 110-ton P&H permitted efficient work procedure. Here the crane loads concrete bucket from mixer truck on job perimeter before delivery to work area.

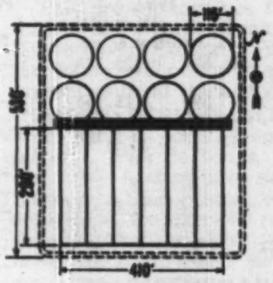
Precise spotting of work loads was a cinch due to P&H planetary boom hoist, unmatched stability and positive-action hydraulic controls.

out reaches . . . enabled Simmons to maintain top production and uninterrupted work flow.

Accurate Spotting of Loads—precise accuracy in spotting loads at far-out reaches was a problem on this job—and was solved through Independent Planetary Boom Hoist, which permitted power lowering of the boom, together with the simple Hydraulic Control System—where the slightest lever or pedal movement produced immediate response—resulted in smoother work cycles with no lost time jockeying for position.

Unmatched Stability—the ability to handle up to 300 feet of boom and the rated loads with utmost accuracy and safety were the result of P&H balanced design, even weight distribution and the extra wide 16′ 10″ crawler assembly. It was this built-in stability that permitted those long reaches with full capacity loads.

For the full detailed report on this unusual job story, write for Case History Report No. 102 . . . to the world's largest manufacturer of power cranes and shovels.



● 8 circular, final settling tanks, each 115′ in diameter.

☐ Overhead gallery separates aeration and settling tanks.

☐ Adjoining aeration tanks form huge rectangle 290′ x 410′.

=== work path of P&H crawler crane

Overall job layout and type of unit construction indicates importance of perimeter work operation.

HARNISCHFEGER P&H

Milwaukee 46, Wisconsin

AS YOU PLAN FOR 1961, PLAN ON MAGNETORQUE . . . AND CHOOSE THE RIGHT MACHINE FOR YOUR WORK FROM 40 DIFFERENT MODELS . . . THERE'S A P&H FOR EVERY JOB! . . . WRITE FOR "THE FABULOUS 40"

CIRCLE 191 ON READER SERVICE CARD

Construction Plans Dip in November

New plans tapered off in November. Heavy construction projects worth an estimated $1.6 billion went on the drawing-boards of architects and engineers across the country—a total slightly below October's volume and 27.5% below the same month in 1959.

Total flow of new projects in ENR's Backlog of Proposed Work is $20.8 billion for the first 11 months, a 10% increase over 1959 and a fat 38% above 1958's low volume for the comparable period.

Volume of proposed private work dropped sharply below volume proposed in October. Main reason for the month-to-month decline was a slide in housing proposals. Commercial building also slipped, but can still be considered a strong market. Industrial building, although up in November, is still relatively low for the third consecutive month.

Huge increases in the public buildings and sewerage categories lifted the volume of state and local construction plans sharply higher than the total for October. However, total state and local proposed work trails last year for the second consecutive month.

Its margin of increase over 1959's first 11 months is now only 10.5%. Federal work, with cumulative proposed volume in the 11 months of $2.1 billion, is 13% under last year's cumulative total. The drop resulted from the small volume of this work proposed in November—only $173 million.

Although highway proposals of $27 million in November were slammed down 91.5% below November 1959, the 11-month total of $2.1 billion is 26% above 1959.

Public buildings proposals in November totaled $684 million, a 29.5% rise over November of last year. For the 11 months, the proposal volume is at $4.3 billion, 10.3% over the same period last year.

The 12% increase in volume of projects passing out of ENR's Backlog into construction-contract status reflects the 14% jump in total contract awards and new owner-built projects reported by ENR during the first 11 months.

Because the flow into the Backlog is approximately double the flow out to contract, the total Backlog climbed to a new high of $124.7 billion for November, 6.9% above the Backlog at the end of November 1959.

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	November 1960 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$124,688	+0.2	+6.9
By Ownership—			
Private	55,919	−0.1	+10.5
State & Municipal	53,987	+0.7	+4.8
Federal	14,782	−0.04	−1.9
By Type of Work—			
Waterworks	2,905	−0.1	+3.4
Sewerage	4,109	+3	+8.6
Bridges	3,294	+0.03	−3.6
Highways	13,433	−0.8	+4.6
Earthwork, Dams and Waterways	12,180	−0.1	+0.6
Public Buildings	22,683	+1.6	+7.2
Industrial Buildings	18,066	−0.8	+6.1
Commercial Buildings	27,290	+4	+17.3
Unclassified, Private	10,563*	−0.06	+0.3
Unclassified, Public	10,165	+0.1	+2.7

* Includes Private Bridges, $101 million

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1960 Nov. (millions)	1960 11-months (millions)	Percent Change from 1959 Nov.	Percent Change from 1959 11-Mos.(a)
Total U. S. (ENR reported)	$1,639	$20,775	−27.5	+10
By Ownership—				
Private	599	11,154	−35.1	+15.6
State & Municipal	867	7,513	−17.4	+10.5
Federal	173	2,108	−40.1	−13.1
By Type of Work—				
Waterworks	24	356	−55.5	−28.4
Sewerage	172	735	+21.9	+5.0
Bridges	33	244	−38.8	−38.4
Highways	27	2,051	−91.5	+26.0
Earthwork, Dams and Waterways	12	625	+33.3	−23.3
Public Buildings	684	4,257	+29.5	+10.3
Industrial Buildings	163	3,115	−31.2	+9.2
Commercial: Mass Housing	193	4,558	−34.3	+32.5
Other Building	220	2,752	−1.7	+14.5
Unclassified, Private	23	729**	−25.8	−22.9
Unclassified, Public	87	1,352	−62.3	+1.1

** Includes Private Bridges $15 million

FLOW OF THE PROJECTS OUT OF THE BACKLOG INTO CONTRACTS

Total U. S. (ENR reported)	1,058	10,439	+42.8	+11.2
By Ownership—				
Private	449	4,247	+43.9	+20.3
State & Municipal	441	4,646	+36.9	+16.3
Federal	168	1,546	+57	−12.2

(a) Based on average week: 47 weeks in first 11 months of 1960 and 48 weeks in first eleven months in 1959.

Outlook for First Quarter: Less for Plant, Equipment

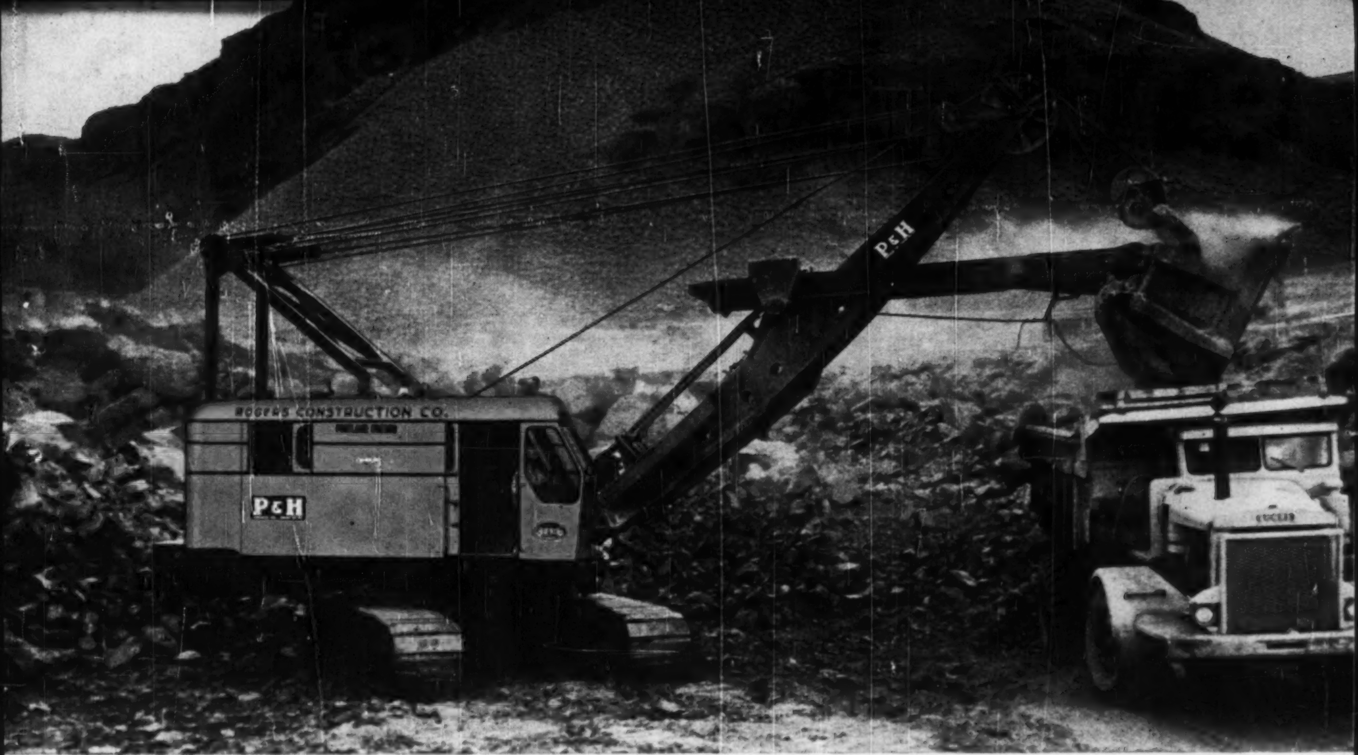
Less spending for new plants and equipment is forecast for the first quarter of next year. The outlook is based on businessmen's plans reported in late October and November to the U. S. Commerce Department and the Securities and Exchange Commission.

First-quarter expenditures of $7.84 billion are forecast by the agencies. This would be a seasonally adjusted annual rate of $34.9 billion, compared with an annual rate of $35.6 billion in the current quarter and actual 1960 spending estimated at $35.74 billion. Last winter the agencies forecast that spending in all of this year would be $37 billion.

The spending slowdown reflects the slump in industrial building contracts awarded in the first half of this year, after the four-month steel strike put a crimp in planning.

Although contracts for new plants as reported by ENR have picked up in the second half of this year, the rise is not sufficient to offset the low volume of the first six months.

Dollar volume so far is down 6%. Moreover, the 1960 flow of new plants in the planning stage point to a slide in construction contracts for industrial plants in 1961's first half.



Magnetorque-equipped P&H Shovels

MOVE A MOUNTAIN IN 8 HOURS

Two 3½-Yd. P&H Crawler Shovels Move 8,832 Tons of Rock In One Work-Day

or **Heintz-Rogers Construction Company,** Portland, Ore.
on a Railroad Relocation Project, Snake River, Wash.

bove: 3½-yard P&H crawler shovel loads 276 trucks (16-ton) in an 8 hour shift.

elow: Fast swings, accurate controls makes it easy to sort out big rocks for rip-rap.

R. A. Heintz, president of R. A. Heintz Construction Co. and sponsor for above job reports: "We've used our two 3½-yard P&H Crawler Shovels extensively on this job—they've saved us about 25% in rock handling and drilling . . . and account for such daily tonnage records as 8,832 tons of blasted rock in 8 hours. Our larger capacity P&H shovels not only give us greater production but, because they handle larger sized rock, reduce our drilling costs—bringing down the over-all cost and earning us a bigger monthly estimate. We're seriously considering buying more and bigger P&H equipment—we're more than pleased with its performance."

This project involves the removal and redistribution of 5 million cubic yards of material along a 12 mile stretch of the Snake River. Construction of the Ice Harbor Dam will raise the water level of the river 40 feet, requiring relocation of the present railroad tracks to higher ground.

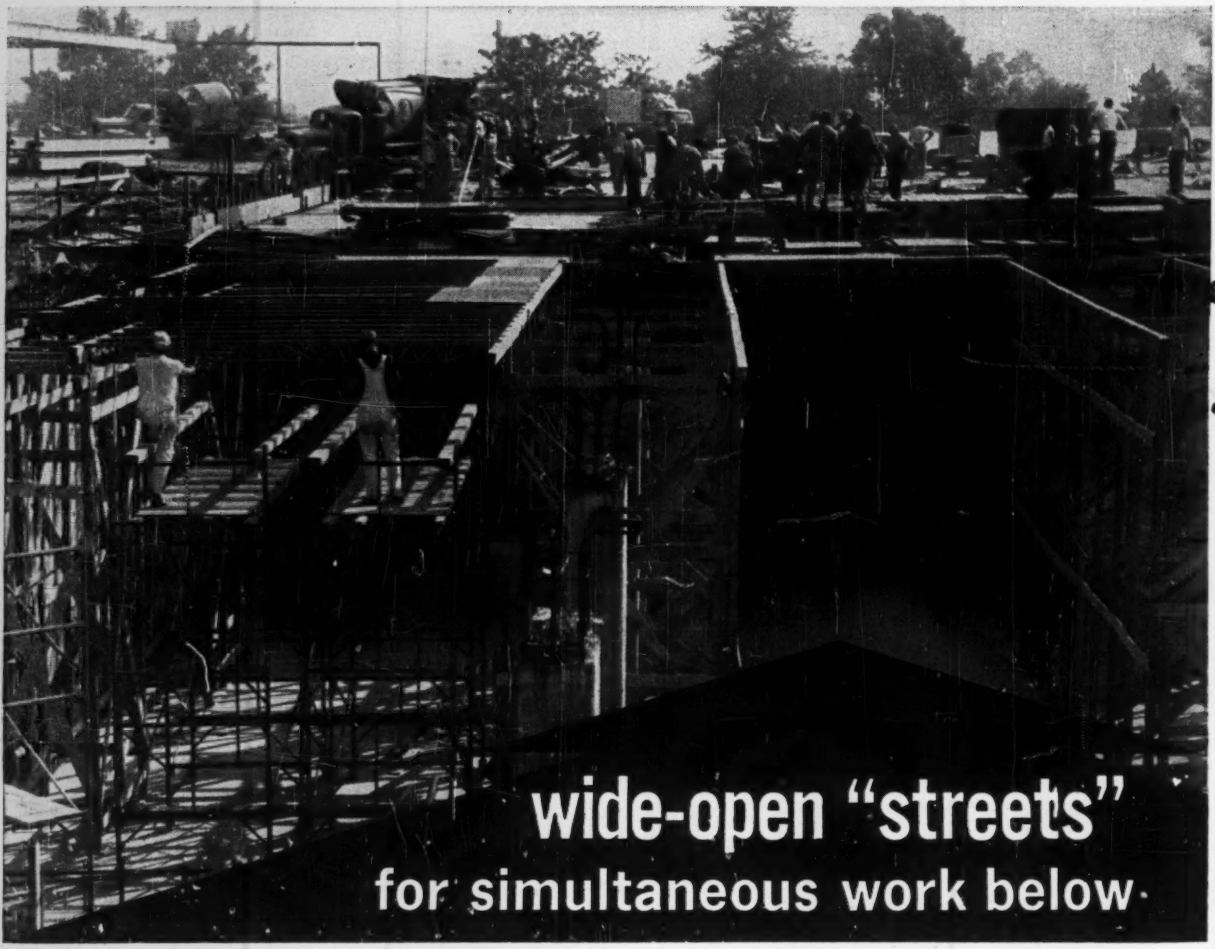
RUGGED, DEPENDABLE IN HEAVY ROCK—"*Working in heavy rock is hard on equipment and hard on a production schedule. With P&H rigs, I've noticed we get faster swing cycles and faster loading with no overheating of the swing clutches.*" So reports Russ Stroud, who has been operating construction equipment for over 24 years. He says—"*Magnetorque swing drive is faster, smoother with no jerking. Doesn't need maintenance and doesn't wear me out.*"

SMOOTH PERFORMANCE, TOP PRODUCTION—The exceptional performance of the two P&H machines has enabled Heintz-Rogers Construction Company to maintain top tonnage performance. Fast, smooth swings, accurate control of the work load and more time on the job has helped speed up work cycles and production. More proof why ONE P&H ALWAYS SELLS ANOTHER.

For the detailed story on this job, write for Case History Report No. 111 . . . to the world's largest manufacturer of power cranes and shovels—

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin

CIRCLE 193 ON READER SERVICE CARD



...another reason why Rex-Spanall shoring speeded this job!

An interesting structure—the new $4,300,000 Federal Records Center, St. Louis. It's a half-million square feet big in space on two floors with several vaults. Over 25,000 cubic yards of reinforced concrete have been put in place.

The contractor applied many new ideas to its construction. For speed, greater safety and lowest possible shoring costs, Spanall was selected. This modern pre-engineered steel shoring with rapid adjustment provided foolproof, simplified erection.

More than this, Spanall brought the *entire* job along faster. With wide-open spaces possible between vertical shores, these "streets" permitted easy, efficient movement of materials and allowed other workmen to hurry the job—all while concrete was poured above.

Project manager Louis Schwartz reported, "Spanall saved on shoring material expense to begin with, and then cut shoring costs substantially."

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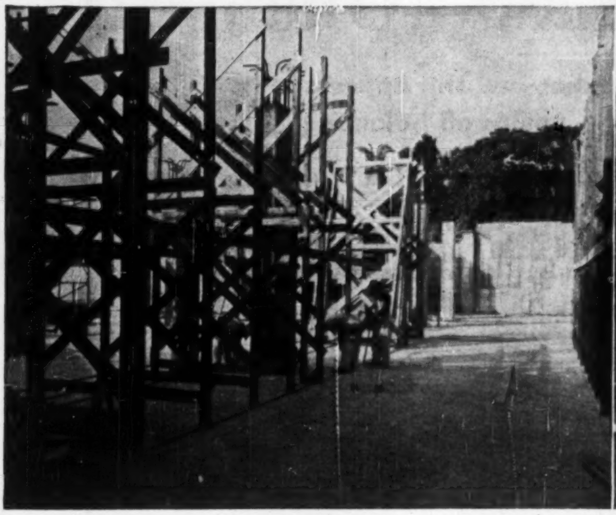
◀ **JOB:** Federal Records Center, St. Louis, for General Services Administration; MacDonald Construction Co., St. Louis, sponsoring contractor of McCarthy-MacDonald-Fruin & Colnon

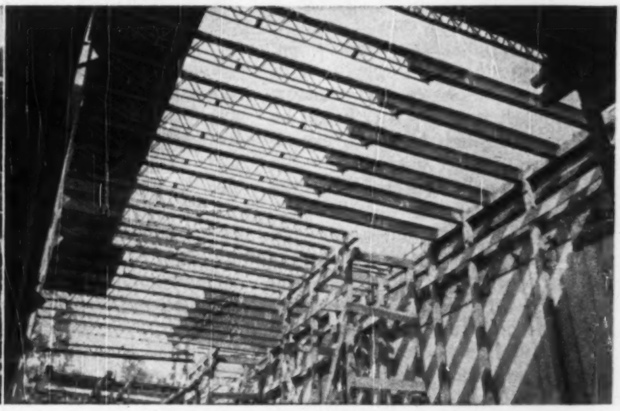


SMALL CREW sets bents for new area. Note wide "streets" which will be below long-spanning Spanall members. Other tradesmen will work here unhampered.

EASY UP! Just two men do rapid setting of Spanall shores. Working on a rolling platform, the Spanall members are lifted only a few feet from platform to ledger.

DECKING AND POURING RIGHT BEHIND. Job is ready for these operations in far less time with Spanall telescopic steel shoring having simple, single eyebolt adjustment. Spanall is removed and reset with ease as pours progress.

"WORK MATERIALS MOVE FREELY; you don't have all those forms. You could drive a truck under the floor we're pouring," project manager says of Spanall. Wide open space below, shown here, illustrates his point.



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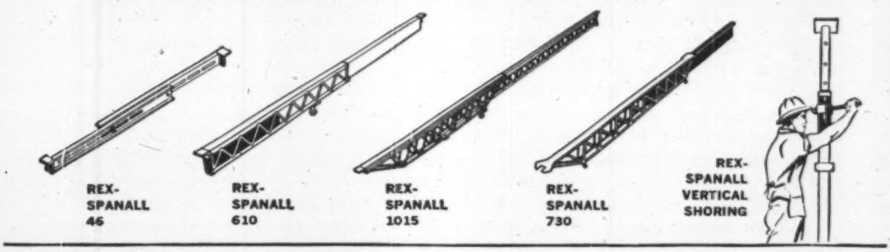

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CIRCLE 195 ON READER SERVICE CARD

Labor

Landrum-Griffin Law—One Year

- **A year after its passage, the new labor law still appears to be having little effect—but it does keep unions off balance.**
- **That's largely because of continued uncertainty about what the law really means—clarification awaits court tests.**
- **One generalization can be safely made: Contractors are satisfied with Taft-Hartley amendments; unions are of mixed opinion.**

By Charles J. Harding

The Landrum-Griffin labor reform law has had little impact on the construction industry so far. The great storm that was raised during its passage last year has lost its punch and seems to be blowing itself out to sea.

Reports to ENR from across the nation indicate that contractors are generally content with the law, although they do have some reservations about its adverse effect on the process of bargaining.

In union ranks, however, labor's initial criticism and objections still have considerable momentum. The new limitations on the right to picket and boycott still hurt, and the new election safeguards and the reporting and bonding requirements have proven burdensome and costly in many cases.

The big question now uppermost in the minds of unions and contractors alike is not whether the law should be clarified or perfected, based on experience with it to date, but whether the new Congress will yield to the nine-year-old union demand for the situs picketing bill. That bill is now the building trades' No. 1 legislative objective. If passed, it will soften the present boycott restrictions, as they apply to the construction industry, and take away from employers some of the protection they have gained over the years.

Beneath these general observations, however, lies a widespread wariness of the law.

Unions and contractors freely admit that they do not know too much about the law, which has been in full force and effect for one year and eight days. All are approaching it with caution as they wait for the courts to interpret it.

Labor Editor Charles Harding analyzes here reports from ENR correspondents across the country.

One of the results most widely reported is that the law is keeping union officials "off-balance" and undermining the effectiveness of union leadership in contractor relations. Few seem to know where the rights of rank-and-file union members end under the "bill of rights." And the law's vagueness about "authorization for bargaining demands" is already cluttering up the bargaining table.

A number of contractors and union leaders have found that they can no longer assume membership acceptance of labor contracts agreed to by negotiators. Now it is "not uncommon," one labor leader observes, for the members to repudiate an agreement because the law has a tendency to stimulate dissident elements.

That particular issue was recently tested in a dispute over a pension plan formulated by the Washington State Council of Carpenters and three chapters of the Associated General Contractors. The court ruled that the plan was lawfully negotiated and that the Landrum-Griffin law is not intended to disturb the bargaining process or to allow union members to rewrite lawful labor contracts.

The same uncertainty made one of the Spokane construction unions go to the bargaining table this year with a full negotiating committee, instead of with the smaller team of the past. That sort of "fishbowl" bargaining, commented one employer, is going to slow down the entire process of concluding labor agreements.

"The law seems to be generally destructive to the labor bargaining atmosphere," according to a prominent San Francisco labor attorney. "It has brought in a large number of lawyers who have had little experience in labor relations or in labor itself," he noted, and will make negotiations "less and less realistic."

"We are finding less of a battle based on principles and more of a continual bickering based on technicalities of the law. You can blame that on Landrum-Griffin," he commented.

Summing up his reservations about the law, a management spokesman said: "It is possible that Landrum-Griffin went out to solve problems that didn't really exist. If this is true, over the years we will have found that hysteria arising from the teamster hearings has caused more problems than it has solved."

The experience of one union in Pennsylvania has convinced it that the law's uncertainty has helped contractors prevent legitimate strikes by questioning their validity under the Landrum-Griffin law. A few union leaders concede they are so afraid of lawsuits under the law that they lean over backwards to avoid them.

The law's new provisions on boycotts, however, have been used successfully in Omaha to halt a laborers' strike against a general contractor for using a nonunion acoustical contractor. They have also been used successfully in New Jersey to break a jurisdictional strike, where the union was using direct pressure on the owner and the secondary employer to gain its goal. And the law has been used, again in New Jersey, to prevent a union from striking to obtain a subcontractor clause under the hot-cargo exception for construction.

As these developments indicate, contractors say they are generally content with the substantive provisions of the law. The stickiest questions seem to relate to what comes under "on site" work in the use of subcontractor (hot-cargo) clauses, and to whether unions can strike to get the concessions the law gives them. Implications of the hot-cargo provision are troubling many.

On the whole, however, contractors have not found the union concessions of any great significance in bargaining.

A Georgia labor leader offers one ex-

Later

planation: "We haven't attempted to use any parts of the Act in our negotiations this year, because we haven't had a clear-cut interpretation of just what the law really means."

Others suggest that the preferential hiring provisions, the pre-hire provision itself, and even the subcontractor (hot-cargo) exception merely legalize practices that have long been common in some areas. Many in the field have also observed that the preferential hiring provisions will remain academic in some areas as long as the unions make no headway on any kind of a hiring hall clause in their labor contracts. Authorization of the seven-day union shop has caused no trouble at all and has generally been written into the law whenever requested in states without right-to-work laws.

The law's specific approval of employer contributions for apprentice training has stimulated the negotiation of such contributions.

The reports to ENR indicate that the law's reporting requirements have given contractors no headaches of any kind. Contractor associations say they have concluded, often with the help of legal counsel, that they need not report as employers or consultants. And individual contractors generally say they engage in none of the activities which the law requires employers to report.

Unions, on the other hand, have reacted to the reporting requirements with mixed emotions. While one union leader on the West Coast calls them "discriminatory" and "a hell of a headache," an easterner says: "We have lived with the law for a year and do not find it objectionable."

A midwestern unionist concedes that the reporting requirements present "nothing serious" and says they may be good from the standpoint of "helping us know our union a little better."

How much the law's provisions on reporting, elections, constitution and by-laws, and bonding will increase the costs of union operations—and who will pay for them—remains to be seen.

"If the additional cost of our operations under Landrum-Griffin causes us to show a deficit," observes one southern building tradesman, "we'll have to have a wage increase. Then, contractors will naturally pass this added cost along to their customers, so the public will end up paying the higher operating cost."

Labor Man for Labor Post

Shortly after noon last Thursday, AFL-CIO President George Meany met with a dozen officials of the federation's Building Trades Department to tell them the name of the Secretary of Labor in the Kennedy Administration — Arthur J. Goldberg, a labor lawyer who came originally from Chicago, Ill.

Their reaction was less than enthusiastic, and Mr. Meany—who knew the appointment was to be announced by President-elect Kennedy that afternoon—defended Mr. Goldberg as an able representative from labor and assured the craft union leaders they would have nothing to fear from him as Secretary of Labor.

Even if Mr. Meany did not entirely convince them, the building trades officials promised to support and work with the man they identify as a strategist for the rival CIO faction within the federation.

The selection of the 52-year-old attorney, who served within the AFL-CIO as special counsel and attorney for the Industrial Union Department, as well as general counsel for the United Steelworkers Union, was strictly Mr. Kennedy's choice. Mr. Meany did not have Mr. Goldberg on the list of candidates he presented to Mr. Kennedy. But once convinced that a Goldberg nomination was what Mr. Kennedy wanted, Mr. Meany helped to clear the way for the appointment.

Actually, though the craft officials object to Mr. Goldberg, they are concerned more with his close philosophical ties with the CIO industrial unions than with any worries about his ability to do the job as Labor Secretary. They preferred, foremost, that an elected union official would get the post—preferably Joseph D. Keenan, secretary-treasurer of the electrical workers.

Once the appointment became final, they immediately took steps to place their own representative in the Labor Department as the number two man. In the building trades conference, presided over by department President Cornelius J. Haggerty, the union presidents designated Lloyd Mashburn, president of the lathers union, as their choice for the Undersecretary of Labor. Mr. Keenan, it was understood, may serve in the Kennedy Administration as an Assistant Secretary of Defense.

When Mr. Kennedy tapped the highly respected union attorney for the top labor post in his Administration, he got a man who, more than anyone else, has guided organized labor's course over the past half-dozen years. As attorney, union strategist, political lobbyist and top negotiator, Mr. Goldberg has been at the front of the most dramatic moves made by organized labor.

As Labor Secretary, Mr. Goldberg intends to become a representative of the Administration—not of organized labor—as he sees it, though certainly his sympathy with labor will be reflected in running the Labor Department.

Probably his touchiest task will be as administrator of the Landrum-Griffin reform law, the newest of the labor laws that are handled in the 47-year-old Cabinet post. As one industry spokesman noted, "This is where we're going to watch and see what he does."

He has other laws to administer, particularly important to the building trades, such as Davis-Bacon and Walsh-Healey, which call for wage determinations on government contracts. And here, Mr. Goldberg will run smack into the fight between the crafts and industrial unions over jobs. Craft union officials profess not to be worried over their prospects here—they expect Mr. Goldberg to be a firm and fair administrator.

It is as labor philosopher that the new Secretary of Labor may make his mark. Even while he was guiding the United Steelworkers through their historic 116-day nationwide steel strike, Mr. Goldberg repeatedly proclaimed that labor and management should get along better. For several years, he has preached that they should meet away from the heat of the bargaining table to "rediscover" their common goals.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division,
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

District of Columbia—Highway Construction—Dept. of Hwys. & Traffic, D. C., Dec. 1, 1960. CONSTRUCTION OF MT. VERNON MEMORIAL HIGHWAY OVERPASS, VIRGINIA APPROACH TO NEW WEST HIGHWAY BRIDGE OVER POTOMAC RIVER, VICINITY 14TH STREET, FEDERAL AID PROJECT INTERSTATE NO. I-95-1(29)0—Invitation No. C-6147-H, consisting of approx. 12,145 LF Steel H Beam piles: 3,130 CY Concrete: 3,410 CF Class A dimensioned masonry; and 4,080 CF Class B stone masonry. Addenda Nos. 1 and 2 will accompany the proposal. (Wage Rates have been predetermined by the Labor Dept.) Bid forms, plans and specifications are now available from the Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $20.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Jan. 4, 1961, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—Building Construction—Dept. of Bldgs. & Grounds, D. C., Dec. 8, 1960. CONSTRUCTION OF BERTIE BACKUS JUNIOR HIGH SCHOOL, South Dakota Ave. and Hamilton St., N.E., Wash., D. C. (Invitation No. C-6162-B). (Wage rates have been predetermined by Labor Dept.). Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $125.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Jan. 19, 1961, in Rm. 424, 499 Penn. Ave., N.W.

Bids: January 24, 1961

Spruce Run Reservoir Project Spruce Run Dam, Dikes and Appurtenant Works—Contract SR-1

SEALED BIDS will be received from bidders by the Department of Conservation and Economic Development, at its offices, first floor, 205 West State Street, Trenton, N. J., at 11:00 A.M. Eastern Standard Time, on Tuesday, January 24, 1961 and will be opened and read immediately thereafter, for Contract SR-1 for the construction of the Spruce Run dam, dikes A and B, spillway weir and channel, outlet tower and outlet works, gaging weir, access roads and final grading in vicinity of dam, installation of equipment and other appurtenant work, all as set forth in the specifications. The Spruce Run dam will be approximately 6000 feet in length along the top, will have a maximum height of about 83 feet and will be constructed of earth compacted by rolling. The limestone foundations under the dam, dikes and certain zones on the perimeter of the reservoir will be grouted as specified. The work is located near the Town of Clinton, Hunterdon County, New Jersey. Bids will be accepted only from bidders prequalified with the Department of Conservation and Economic Development in accordance with R.S. 52:35.

The bid, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in an amount not less than 2 percent of the bid, an Agreement of Surety, an Affidavit of Non-Collusion, the name and address of the prequalified subcontractor to do the grouting, drilling, core boring and sampling, an Appointment of Agent by Non-resident Bidders and a revised Financial Statement and Plan and Equipment Statement on prequalification forms, must be enclosed and sealed in an envelope provided for that purpose by the Department. Bids not so submitted will be rejected. Bids must be delivered at the above place on or before the hour named, as no bids will be accepted after the hour specified.

Contract pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety and subcontractor for grouting etc., and separate folders of contract drawings can be obtained in the office of the Chief Construction Engineer of the Bureau of Design and Construction of the Division of Water Policy and Supply of the Department of Conservation and Economic Development, 219 West State Street, Trenton, N. J., upon application in person or by mail, by depositing the sums of $15.00 for each contract pamphlet and $10.00 for each folder of contract drawings. The deposit for the contract pamphlet will be refunded within 30 days of the award of contract upon the return of such document in good condition without written entries. Deposit will not be refunded for the folder of contract drawings. For further particulars apply to the office of the Chief Construction Engineer.

The Commissioner reserves the right to select the bid, the acceptance of which will be most advantageous to the State, price and other factors considered. Any and all bids may be rejected when the Commissioner determines that it is in the public interest so to do.

Salvatore A. Bontempo
Commissioner of Conservation
and Economic Development

U. S. Government

Sealed bids for construction of the Treatment and Cafeteria Building, St. Elizabeth's Hospital, Washington, D. C., will be received until 2:00 PM, EST, January 19, 1961, in Rm. 7122, GSA Regional Office Building, 7th & D Sts., S. W., Washington, D. C., and then publicly opened in Rm. 7128 at the above address. Public Buildings Service, Rm. 1308, GSA Bldg., 19th & F Sts., N. W., Washington 25, D. C., Phone EXecutive 3-4900, Ext. 2397 will furnish, upon request, 2 sets of bidding material to General Contractors interested in bidding the complete project; 3 additional sets may be obtained by depositing $100.00 per set. One set of drawings and specifications will be supplied to each principal subcontractor, as determined by the Service, upon receipt of deposit in the amount of $100.00. Deposits will be refunded for such sets if returned in good condition within 20 days after bids are opened. Checks or money orders for deposits or furnished as bid guaranty must be made payable to General Services Administration. One set of drawings and specifications will be furnished to builder's exchanges, chambers of commerce and other similar organizations with the understanding that the set will be retained on their premises and made available for inspection by any interested subcontractor or material firm. Commissioner of Public Buildings, General Services Administration.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5462) will be received at Ainsworth, Nebraska, until 10 a.m. Central Standard Time, February 2, 1961, for furnishing labor and materials for Merritt Dam and Access Road, Ainsworth Unit, Nebraska, Sandhills Division, Missouri River Basin Project. Location Valentine, Nebraska, in Cherry County. Principal items are 1,738,000 cu. yds. excavation for dam; 1,400,000 cu. yds. fill; 25 miles—constructing access road; and other work. Completion time 700 days. For particulars, address Bureau of Reclamation, P. O. Box 186, Ainsworth, Nebraska; Building 46, Denver Federal Center, Denver 25, Colorado or Building 53, Denver Federal Center, Denver, Colorado. Floyd E. Dominy, Commissioner.

Read the Official Proposal Column of
ENGINEERING NEWS-RECORD
This Week and Every Week

Bids: See Advertisement

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract GWB-190.035—George Washington Bridge—Lower Level Expansion—New Jersey Approach—Phase 7—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, January 19, 1961.

Contract NYA-410.015—New York International Airport—International Arrival and Airline Wing Buildings—East and West Aprons—Blast Fences—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, January 12, 1961.

Contract NYA-340.003—New York International Airport—Central Heating and Refrigeration Plant Expansion—Cooling Towers—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, January 19, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, New York. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115 where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, December 22, 1960

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OFFICIAL PROPOSALS

Bids: January 10, 1961

Intake Works and Outlet Works of the West Delaware Tunnel Contracts 456 and 457

SEALED BIDS will be received by the Board of Water Supply at its offices, thirteenth floor, 120 Wall Street, New York 5, N. Y., until 11:00 A.M. Eastern Standard Time, on Tuesday, January 10, 1961, for the following two contracts for the construction of the Intake Works and the Outlet Works of the West Delaware Tunnel, all as set forth in the specifications:

Contract 456, for the construction of the Intake Works of the West Delaware Tunnel, including a road to the intake chamber; for installation of equipment; for stream control; and for other appurtenant work. The site of the work is about one mile east of the hamlet of Cannonsville, in the town of Tompkins, Delaware County, New York.

Contract 457, for the construction of the Outlet Works of the West Delaware Tunnel, including the installation of a steel interlining at the outlet end of the tunnel; for the installation of equipment; and for other appurtenant work. The site of the work is about 1¼ miles east of the hamlet of Grahamsville, in the town of Neversink, Sullivan County, New York.

A bidder on both of these contracts may, if he so desires, specify in the bid form of either or both contracts that he will agree to make a percentage reduction from the total cost of the contract, if both contracts are awarded to him.

Contract pamphlets can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $10.00 for a set of pamphlets for each contract. There will be a charge of $2.60 to cover mailing costs for each set of contract pamphlets.

Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5457) will be received at Huron, South Dakota, until 10 a.m. Central Standard Time, February 21, 1961, for furnishing labor and materials for Sioux City-Spencer and Sioux City-Denison-Creston 161-Kilovolt Transmission Lines, Missouri-Oahe Transmission Division, Missouri River Basin Project. Principal items are 1,434 Structures—Furnishing and constructing structures of various types with maximum pole lengths from 60-foot to 95-foot; 3,267 Assemblies—Furnishing, assembling and attaching insulator assemblies of various types and various numbers of insulators per string; 131 miles of line—Furnishing and stringing three 954,000 circular mil ACSR conductors; 82 miles of line—Furnishing and stringing three 556,000 circular mil ACSR conductors; and other work. Completion time 420 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 825, Huron, South Dakota; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5459) will be received at Hardin, Montana, until 10 a.m., Mountain Standard Time, January 19, 1961, for furnishing labor and materials for Streets and Water and Sewerage Systems for Yellowtail Government Community Facilities, Yellowtail Unit, Montana, Missouri River Basin Project. Location near Hardin, Montana. Principal items are 21,180 lin. ft., excavation and backfill of pipe trenches; 425 cu. yds., concrete; 90 tons liquid asphalt; 13,350 lin. ft., furnishing and laying 6- and 8-inch diameter water pipe; and other work. Completion time 240 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box E, Hardin, Montana; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSALS

Bids: January 6, 1960

NOTICE
New Bid Date: January 6, 1961
Original Bid Date: December 6, 1960

Feeder Road Program

MINISTRY OF PUBLIC WORKS
REPUBLIC OF EL SALVADOR
BIDS: JANUARY 6, 1961
NOTICE TO CONTRACTORS

The Ministry of Public Works of the Republic of El Salvador advises that on January 6, 1961, bids will be received for the construction of a major portion of the proposed Feeder Road Program of the Country. The Specifications, Plans and Contract Documents have been for sale in El Salvador since October 31, 1960.

All Contractors interested in taking part in this bidding are requested to obtain the necessary Documents, Plans and Specifications from the Office of the Proveeder Especifico de Obras Publicas, Edificio Morazan, 8ª C. P., San Salvador, El Salvador, C. A. All requests must be accompanied by a certified check in the amount of Sixty Dollars ($60.00) which will not be returned.

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REPUBLIC OF EL SALVADOR,
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P-5801, Engineering News-Record
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• POSITIONS VACANT

Estimator — For established contractor in Deep South Metropolitan area, specializing in Heavy Construction, Foundations and Sewer and Water Plants. Graduate Civil Engineer, Age 30 to 38 preferred. P-5645, Engineering News-Record.

Lead Draftsman—Concrete Reinforcing Steel Engineering Dept. Should have 5 yrs. experience in detailing Reinforcing Steel. Experience in estimating and sales also desirable but not necessary. Salary open. Write: Phoenix Manufacturing Co., Division of Union Tank Car Company—Attn: Mr. C. E. Hunt, P. O. Box 1207, Joliet, Illinois.

Draughtsmen to become part of expanding organization; competent, experienced with engineering work including reinforced concrete, piping and equipment. Also C.E. graduate to assist draughtsmen with layout of sewage treatment works. Supply samples of work and brief resume of experience—Lewis E. Kohl, Inc., 16 State Street, Rochester, N. Y.

Civil Engineer I—for City Engineers Department, Salary Range $440-$550 per month. Graduate Engineer with Sewer Design Experience preferable, however all types of experience will be considered. Apply, City of Fort Lauderdale, Civil Service Department, P. O. Box 1181, Fort Lauderdale, Florida.

(Continued on the following page)

CIVIL ENGINEERS

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P-5813, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

CIVIL ENGINEERS

Civil Engineers with 2 to 15 years of experience in layout and design of dams, intakes, powerplants, spillways, canals, etc., to fill immediate openings in a design office. Some experience in writing reports desirable but not essential. Please send complete resume to Personnel Manager.

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Parke, Davis & Company, Detroit 32, Mich.

POSITIONS VACANT
(Continued from preceding page)

Electrical System Design Engineer. At least 3 years experience in transmission, distribution or substation design. Resident Engineer — experienced in construction of rural type transmission, distribution and substation facilities. These openings offer permanent employment with opportunity for advancement. P-5810, Engineering News-Record.

Engineer—Estimator—Experienced in plant, mill and highway bridge construction. Location — Jacksonville, Florida. Send complete resume with anticipated salary to: P-5806, Engineering News-Record.

General Superintendent for roads, sewers and utility work in New Jersey area. Give full details as to age, experience, marital status and salary desired. P-5803, Engineering News-Record.

Water Resources Planner. Experienced engineer in water supply studies for regions or large cities and industries. Public health and waste treatment experience desirable, but not necessary. Good knowledge of cost analyses. Report writing ability necessary. Minimum of five years experience required. Location Cincinnati; similar positions expected at Chicago and Denver. Salary $7,560 to $12,210 per year, depending upon qualifications. Civil service requirements and benefits apply. Write to Director, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

Civil Engineer. Construction materials company with 32 locations in New Jersey & Pennsylvania has an opening in engineering department for engineer with experience in aggregate plant layout and design. Excellent working conditions, fringe benefits. Send resume to Houdaille Construction Materials, Inc., 10 Park Place, Morristown, N. J., Attention Personnel Manager.

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Highway Design Engineer, preferably registered, to head up the preparation of contract in Connecticut. Minimum 5 yrs. experience required. Salary $7800-9000. Send complete resume. P-5816, Engineering News-Record.

Wanted: Graduate Civil Engineer for responsible charge of Engineering Section in City of Bettendorf Public Works Department. Good opportunity for advancement and development of Engineering Section in the fastest growing city in Iowa. Starting salary $5,800.00 to $6,300 depending on experience and qualifications. Write H. W. Wiesen, Director of Public Works, City Hall, 1617 State Street, Bettendorf, Iowa.

• *POSITIONS WANTED*

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(Continued on opposite page)

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P-5812, Engineering News-Record
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(Continued from opposite page)

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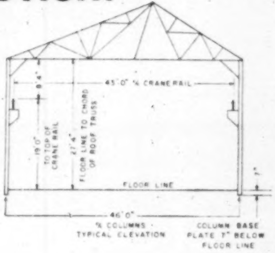
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ENGINEERING NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member ABC

Number of copies of this issue printed 89,484

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Editorials

Christmas Wishes

THESE THINGS, among many others, we have wished for you, our readers, on this page this year.

* * *

Bids that include profits.

Tighter specifications, through an awareness of what loose specs can cost.

More sophisticated management for construction companies and firms of engineers and architects.

Determination to wipe out the payola, the graft, the bribery that have been brought to light this year in legislative hearings and in the courts.

Appreciation of the real purpose of codes of ethics.

Recognition among employers of their obligation to foster the professional development of their engineer employees.

Civil engineers educated to be the leaders of the construction industry.

Increased political and civic responsibility.

More D. B. Steinmans.

Labor-management cooperation on the problems of wages, work practices, jurisdiction, safety and training.

An attitude of urgency about the business of building missile bases to take the lag out of their construction.

Better manners and better housekeeping among contractors who are prone to clutter streets and sidewalks with their materials and equipment, inconveniencing if not endangering the public.

Freedom from discrimination against Negro workers in the construction trades.

Prudence on the part of all public agencies in their public relations and their use of the right of eminent domain.

An appreciation of the respective roles government engineers and private consulting engineers must play if the construction industry—so heavily involved in public works—is to function at top efficiency.

An appreciation that while public works construction must be maintained at a high, steady rate, it is not something that can be turned on and off like a faucet to counter cyclical ups and downs of the economy.

Flood-plain zoning to prevent building in the river bottoms that suffer periodic ravages from high waters.

A treaty to tie down the commendable U.S.-Canada accord on future development of the Columbia River.

Realization that desalting of the seas is not just around the corner, that we'd better keep investing sensibly in conventional water supplies.

Public support for pollution control and upgrading of federal effort in this area.

Responsibility on the part of municipal officials who are too often too willing to let Washington do it.

Leadership to bring the cities out ahead of their growing needs for transportation, housing and utilities.

Realization, especially in cities, that highways are not the total answer to the transportation problem, that highway engineering and city planning should be inseparable.

Good judgment on the part of the House subcommittee investigating the Interstate program.

A best possible press for the highway program and those who are carrying it out.

Successful efforts by AASHO in plugging the holes in highway construction's administration.

Early and full disclosures of the information developed by the AASHO road test in Ottawa, Ill.

Assignment of consulting engineers to road and bridge problems of the many counties in the U.S. that lack adequate engineering personnel.

Uniform building codes, up-to-date building codes, adequate building codes—any improvement anywhere in this generally confused area that affects construction.

More attention to the performance of new building materials and the mechanical equipment going into buildings.

Wisdom in zoning lest the rules be overly restrictive instead of permitting orderly development.

Wider acceptance of the challenge to design and build plants for nuclear power that can compete on a cost basis.

Simplicity in soil classifications.

Use of the new tools of design—plastic design and ultimate design—which have only mental inertia against them. And mechanization of design through computers.

Efforts to solve the problems of prestressed pavements.

A try at nuclear blasting to establish whether it's feasible.

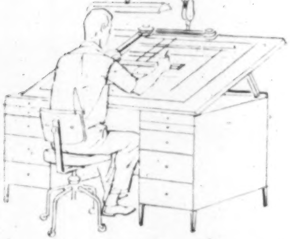
Automation of construction equipment in every possible application—as in batching plants and graders now, perhaps pavers next.

More money for research in civil engineering and other construction problems.

Better meetings of technical societies, by greater concentration on fewer areas of discussion.

* * *

We repeat these now as Christmas wishes in the belief that to the extent construction people help provide themselves and the nation these things, they will indeed have a Merry Christmas, a Happy and Prosperous New Year.



LONG TERM ECONOMY

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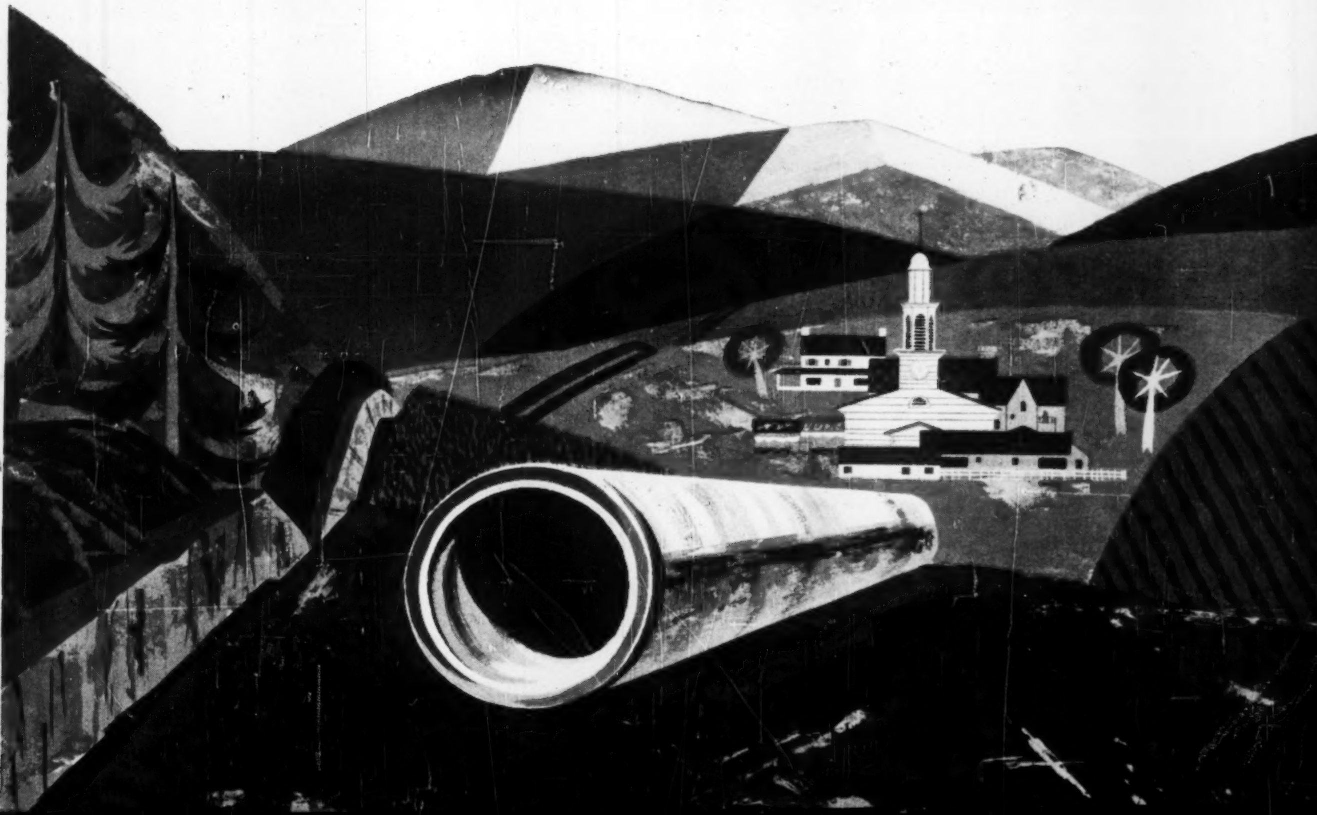
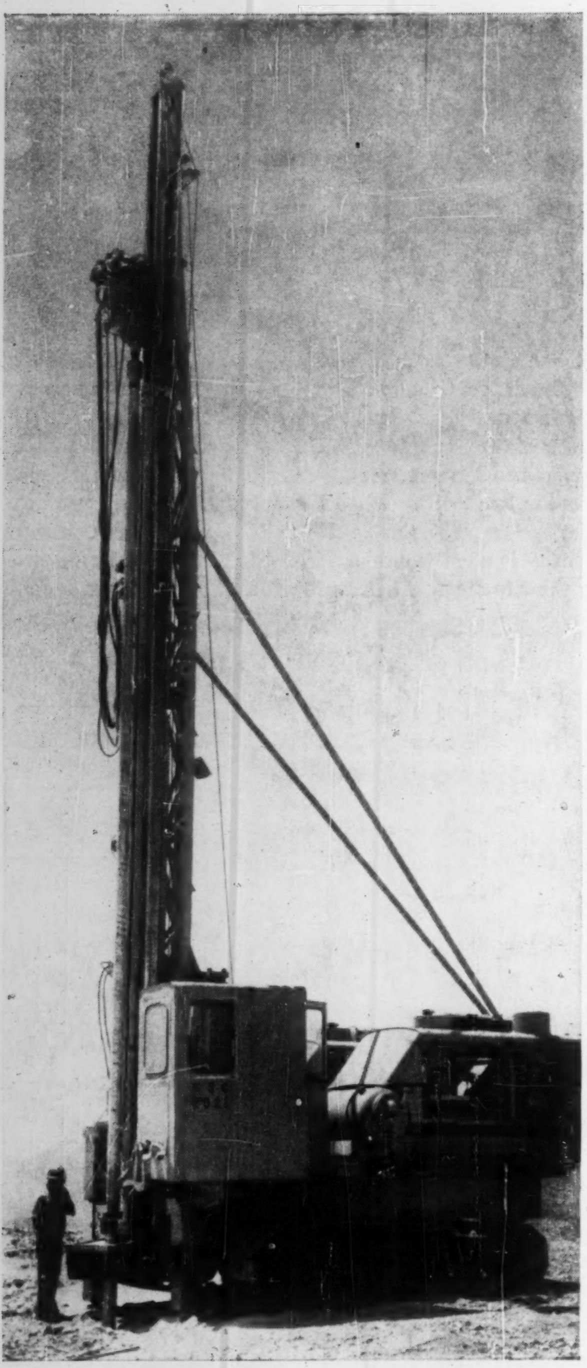




How Ingersoll-Rand assures accuracy of "Quarrymaster's" drill feed under 900-blow-per-minute drilling

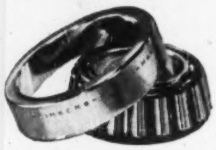
STRIKING 900 blows per minute and drilling through all kinds of hard broken rock formations puts terrific loads on the air motor that feeds the "Quarrymaster" drill. Yet the motor assures accurate, positive control of drill feed; fights a tight steel when drilling broken and seamy ground. One big reason the motor works so dependably is that the worm gear is mounted on Timken® tapered roller bearings. Ingersoll-Rand selected Timken bearings because . . .

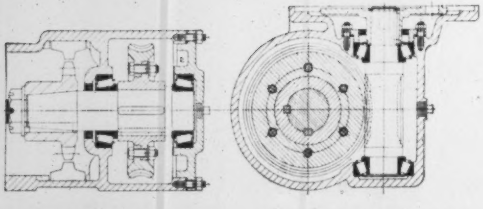
1. *They take all loads.* The tapered design of Timken bearings enables them to take *any* combination of radial and thrust loads. And full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity—to take heavy shock loads.

2. *They reduce maintenance, last longer.* Because they hold shafts concentric with their housings, Timken bearings make closures more effective in keeping dirt and moisture out, lubricant in, maintenance down. Bearings and parts last longer.

And Timken bearing-equipped machines give you the extra advantages of Timken Company leadership in tapered roller bearing design plus service from graduate engineer salesmen. Backing this leadership are the most modern testing, research and development facilities in the bearing industry.

When you buy Timken bearings you get . . . *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloys Steel and Removable Rock Bits.* Canadian Division: Canadian Timken, St. Thomas, Ontario.





How Timken bearings are used on the worm drive in Ingersoll-Rand's QM-3-DHD-400 "Quarrymaster" —to take heaviest loads, cut maintenance.

Industry rolls on

TIMKEN®

tapered roller bearings